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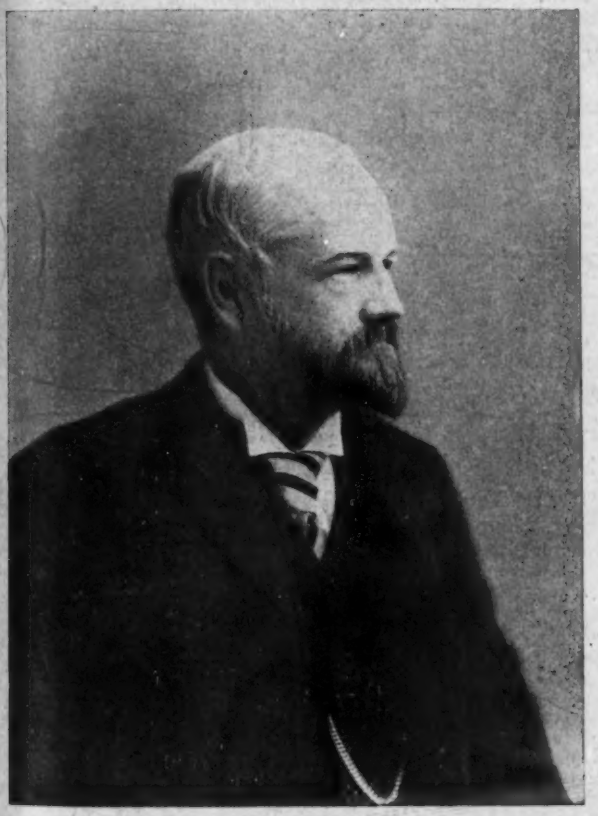

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President-Founder, The Polytechnic, Regent Street, London.

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HELPS TO HIGHER EDUCATION.

AMONG the many organisations which hold annual gatherings in the metropolis in the month of May, there are few that appeal with more force and directness to the class for whom this journal is produced than two, which have recently called attention to their claims by large meetings in noble city halls, with eminent men of learning for their leaders and exponents. These two organisations are, first, the Society for the Extension of University Teaching, the supporters of which met on May 6th in the Egyptian Hall at the Mansion House, under the presidency of the Lord Bishop of London, and were addressed by Dr. Alexander Hill, the Vice-Chancellor of Cambridge; and, second, the National Home-Reading Union, which met on May 9th in the magnificent hall of the Drapers' Company, with the Worshipful Master in the chair, and the Right Hon. James Bryce for the principal speaker.

These two societies may fairly be regarded as healthy manifestations of that democratic tendency which has marked so many of the movements of the last few decades. They may well be spoken of together, as they have much in common, the primary object of each being the popularisation of true learning. The special aims, as well as their methods of work, may vary, but they undoubtedly harmonise, and may be described as supplementary to each other.

The work of both tends, in our opinion, to the advancement of higher education, for the plane of any department of study is determined, not so much by its ease or difficulty, as by the purpose and motive with which it is pursued. The lower education is that which aims at meeting merely material needs; the higher, that which aims at developing mental powers, at ennobling and lifting up one's views of human life and its possibilities. This characteristic of university extension work has been well described as the endeavour to supply, "not the means of livelihood, but the means of life; the opportunity of making a worthy use of leisure, and of laying therein the only real basis of social equality."

THE UNIVERSITY EXTENSION SOCIETY

seeks to secure this end by organising many educational centres in London and the provinces, and arranging for systematic courses of lectures by professors and lecturers of ability and high repute. The subjects dealt with are various enough to suit the taste of every class of students—literature, history, art, natural science, philosophy, and economics. The lecturers include such masters of their respective subjects as Dr. Gardiner and Mr. J. H. Rose in history; Professor Hales and Mr. Churton Collins in English literature; Mr. Philip Wicksteed on Dante; Professor Baldwin Brown and Mr. Arnold Mitchell on architecture; Professor Lewis on chemistry; and Mr. F. W. Rudler on geology.

The mode of operation of the society in its various branches may be briefly described. A course of lectures usually consists of ten, which are given at intervals of a week. A syllabus, provided at the outset, shows, in more or less detail, the ground to be covered in the course. Text-books and books for supplementary study are recommended. Each lecture is usually followed by a class, in which the lecturer answers questions, elucidates difficulties, and gives suggestions for further study. Papers and essays on the subjects of the different lectures are required from the students; and at the end of the course an examination is held, and certificates are

Next Month:

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issued to those who satisfy the examiners. Students are encouraged, where it is possible, to take two or three consecutive courses of lectures on the same subject, in order that their knowledge may be more thorough and more permanently helpful.

We venture to commend these University Extension courses of lectures to teachers who may be within reach of them. Their value as a means of rational enjoyment, of whetting the intellectual appetite, of brightening one's life by bringing into it new and living interest, will soon become apparent; and all this will react with powerful influence on the teacher's life in school.

Another way in which this organisation seeks to bring the spirit of the higher learning of the universities into the life of the people is by arranging for summer meetings of students at Oxford and Cambridge, and also in London. By this means people to whom the ordinary university training is utterly unattainable may spend two, three, or four weeks within the precincts of one or other of the ancient colleges, and breathe for that brief space the serene air which pervades their courts and halls. Many of our readers have probably availed themselves of such an opportunity of making themselves acquainted with the conditions of the student life of the university, and this notice may pleasantly remind them of their all too brief experience.

DR. HILL ON "THE GOAL OF STUDY."

At the annual gathering of the students and friends of the University Extension movement, it is customary for an address to be delivered by some eminent man of letters or of science. Among others, Mr. John Morley has given a stimulating address on "The Study of Literature," and Dr. Westcott, the Bishop of Durham, a most eloquent and inspiring discourse on "Ideals." At the recent meeting the subject chosen by Dr. Hill was "The Goal of Study," and those who heard the charming manner in which the Vice-Chancellor treated this subject will not soon forget the scholarly and yet natural vein of humour which ran through the whole, the epigrammatic touches and the pleasant anecdotes with which the serious arguments were enlivened. The aim of study he regarded as twofold—first, the training of the mental powers, the development of taste and judgment; and second, the acquisition of knowledge. Here is one of the anecdotes: "When it was remarked to the late Master of Trinity that such an one had so much taste, Dr. Thompson listened in his supercilious way, and then replied, 'Ah, and all of it so very bad.'" For the purpose of training he defended the claims of classical education. Here came one of the epigrams: the value of the classics lay in their uselessness; by which was to be understood that practically no measurable material value belongs to the substance of classical writings, but their value as a disciplinary study, as intellectual gymnastics—mental dumbbells—is unrivalled. "In the study of the classics, as in no other study, could the two aims be distinguished. For the boy the language, for the man the thought which the language conveyed."

In the latter part of his address Dr. Hill turned his attention to the bearing of study on his own particular field, that of biology. "How could they make a competent biologist? It would at first be thought, by an early training in science. His experience gave to that an emphatic denial. Science scholars often had a knowledge that was extraordinarily active and extensive, but they had no mental training. They were quickly hauled over by the boys from public schools, who, when they came up, did not know a test-tube from a barometer. The science scholar as turned out by the schools was a prodigy of information, and difficult to beat on the earlier levels of his subject; but as soon as he reached a region where solid facts were left behind, he was like a clodhopper on a glacier without pick to grip or head to dare. They could not make a biologist out of a man who was a wrangler by nature. He only dealt with formulæ, with abstractions. He might make a good judge or a Member of Parliament, because an Act of Parliament was nothing but a concatenation of formulæ, and no one could hope to understand it without a knowledge of the binomial theorem. The conclusion he came to was that for success in any department of human thought a man needed such training in other directions as would give him a catholic sympathy."

Like other social movements, University Extension has its organ in the press—*The University Extension Journal;* and in the number for May appears a specially interesting article on the relation of the work of the society to the training of pupil-teachers. Acting on recommendations made by the Departmental Committee on this matter, the London Society has arranged for courses of lectures at the Pupil-Teacher Schools, and Dr. Kimmins, the secretary, notes the encouraging success which has already attended this experiment. A large proportion of the London candidates who attain high positions on the Scholarship list hold University Extension certificates. The system is likely to have an admirable influence on pupil teachers, by checking the tendency to cram and to mechanical work, and by broadening their outlook on the intellectual field.

THE NATIONAL HOME-READING UNION,

as we have said, has practically the same general object in view as the University Extension movement. But while University Extension appeals to the teacher, more particularly by its value to himself, as affording a most desirable form of mental training and intellectual recreation, the Home-Reading Union may be made to have a very direct bearing on his professional work.

On previous occasions we have called attention to the mode in which this Union does its work. A very few words, therefore, will suffice on this part of our subject.

While the system of lectures forms the essential feature in the work we have already described, and further study is pursued under the guidance of the lecturer, the Home-Reading Union makes the books the chief means of study. It seeks, however, to give something of the personal element and something of a social character to its work, by encouraging the formation of circles of friends and neighbours to meet and discuss the matter of the books appointed to be read at home. The leader of the circle acts as a sort of president and secretary, and gives such guidance as he can. Magazines issued in nine out of the twelve months contain articles by able writers on the books specially appointed for reading. Correspondence, and the writing of papers on the subjects of the books read, are encouraged; and collections of pictures, lantern slides, and objects to illustrate the chosen books are lent out on hire from the central office.

In our account of the Summer Meeting last year at Exeter, we summarised the address given there by Sir George Kekewich, who heartily approves of the work being done by the Union. The full text of the address is now published, and may be obtained from the secretary, Miss Mundy, of Surrey House, Victoria Embankment.

The London School Board and several others have recognised the value of the methods of this organisation,

BRITISH MUSEUM

and have encouraged the formation of circles in the Day and Evening Schools. Such circles, with a teacher for leader, may take the place of reading classes, the books may be systematically read at home by the members, and the weekly meeting at school may be devoted to the illustration and elucidation of the chapters thus read.

The work of the Union in providing carefully-selected book-lists, in giving sympathetic guidance and advice, is most valuable, and deserves the hearty support of every one interested in the education of the people. It has the earnest and active support of many influential persons. Her Royal Highness Princess Louise is its President, the Bishop of Hereford is the Chairman of its Council, and Dr. Hill, Vice-Chancellor of Cambridge, presides over its Executive Committee. At its annual meetings addresses have been delivered by Sir John Gorst, Mr. Augustine Birrell, and other eminent public men.

MR. J. BRYCE ON "WHAT READING MEANS."

In the address already referred to as delivered on the ninth of May, the Right Hon. James Bryce, in a remarkably thoughtful and suggestive manner, discussed the question "What Reading Means." He opened by referring to the need of such work as the Home-Reading Union undertakes, in offering wise sympathy as well as sound guidance to its reading members. Then he pointed out that the real object of reading was to get at the mind and thought of the writer. The most effective way in which minds could act upon each other was by talking. In conversation the impact of mind upon mind provoked immediate response. The essence of reading, to be of any value, lay in the mind of the writer making such impact upon the mind of the reader as to awaken interest and to cause a reaction. In this way only could there be any lasting result; and the result to be aimed at was the appropriation of the writer's thought by the reader. The thought should become assimilated, and henceforth be part of the reader's self.

The lecturer referred with great satisfaction to the very cheap issue of standard works, such as the "Penny Poets" and other series of Mr. Stead, to whom great credit was due for that successful enterprise. He thought there was room also for an edition of such books at a slightly higher cost, with better paper and print. Mr. Bryce cleverly examined the famous *dictum* of Cobden that a single copy of *The Times* contained more valuable information than the history of Thucydides. This was probably true; but then the reader of *The Times* cannot possibly appropriate its miscellaneous contents. He runs hastily through it, and straightway forgets it all; unless it be some part which specially appeals to him, and awakens in him that kind of responsive reaction which springs from personal interest. Hence was deduced the need of concentration if one's reading is to be really of value. Reading would be most profitable if it were confined to one or two branches rather than distributed over a great number. The lecturer deprecated hasty reading—skimming a book; but he considered it desirable to cultivate the habit of reading rapidly—that is, absorbing the subject-matter of a book in a short time. This power was remarkable in Lord Macaulay. With such readers, indeed, the power must be regarded as a gift of nature.

Speaking of fiction, Mr. Bryce said there was need for a classification of fiction. Some was as true and as valuable as books of facts. Such were the novels of Scott and Miss Austen, with their truth to human nature, and Trollope and Miss Burney were valuable for their pictures of manners. Librarians were apt to be the more proud of the library as they could show a small percentage of circulation in the works of fiction. Some novels might be regarded as a kind of poetry, true works of imagination, and some poems, such as *Armgart* and *The Spanish Gypsy* of George Eliot, might have been quite as effective if written in the form of novels.

After giving some practical hints to help the reader to retain what he read, Mr. Bryce reimpressed the importance of concentration, though he would make an exception to this extent, that whatever subject a person might choose for his chief reading, he should not neglect poetry, which he regarded in mental diet as of like value to bread in the material diet.

MR. SADLER'S THIRD BOOK OF SPECIAL REPORTS.

The Swiss System of Education.

WHEN the time comes for the faithful historian to enumerate the follies and failures of the nineteenth century, he will not omit to place to the discredit of England the crass neglect of middle-class education to which we all with one consent plead guilty, the guilt being all the more reprehensible because it lacks the saving grace of repentance. Philippics innumerable have bewailed the chaotic condition of this part of our educational system, and yet the cosmos which is to replace the chaos makes but little sign of an early appearance. Certainly the belated, half-hearted measure which the Duke of Devonshire—no educationist, as he bluntly tells us—is leisurely piloting through the House of Lords is a sorry remedy for the ills that middle-class education is heir to. Yet the inhabitants of Switzerland as Mr. Morant points out in his paper, are in the enjoyment of state nurture of secondary education without the sacrifice in any degree of

Freedom, Elasticity, Variety,

which we all agree in regarding as the necessary conditions to successful teaching. In addition, Mr. Morant has many weighty things to tell as to the manner in which the hardy Swiss settles the problems of irregularity, superannuation, etc., which have troubled, and are still troubling, the politics of English primary education.

It will be seen, then, that Mr. Morant's contribution to the third volume is interesting from the double standpoint of primary and secondary education.

In the introduction are set out the difficulties in the path of the Swiss educational reformer. Three or four different languages, two religions, sturdy insistence upon the retention of cantonal freedom, to say nothing of poverty, geographical difficulties in the way of intercommunication—these are stones of stumbling which beset not the path of the English reformer, who, nevertheless, is still helplessly sighing for what the more earnest Swiss has long since possessed himself of; the result being, not dispiriting uniformity, as the Cassandras would have us believe must be the case when the seal of the state is set on middle-class education, but

Inspiring Variety

suited to the diverse needs of the twenty-six cantons, as understood by themselves.

Beyond insisting on primary education being everywhere free and compulsory, the Bund, or Federation of States, does not interfere with popular education at all, except with respect to child-labour in factories, which cannot commence until

The Completion of the Fourteenth Year,

and in the matter of *military service*, concerning which it is enacted that every youth between the ages of ten and fifteen shall receive instruction in military drill and exercises as a compulsory subject of the school programme. It is easy to see that this freedom from Federal control is due neither to lack of regard for education, nor to a disbelief in central

control: quite the reverse is the case; only each canton is regarded as a state, and so the central control is naturally

Cantonal Control,

which is very real and effective, and just as intelligent as effective. It says much for the zeal of the Swiss that the government of Aargau should have made the establishment of a primary school compulsory so far back as the sixteen hundreds; nor was the rest of Switzerland slow to follow the good example thus set, and

Primary Schools for Rich and Poor alike

soon made their appearance on all sides, much to the appreciation of all classes of the community, who did not fail to make use of them, the rich sitting side by side with the poor, as is most fitting everywhere. Mr. Morant contrasts this with the ludicrous safeguards that were thought necessary in England in 1864 to ensure that only the

Labouring Classes

should have admission to the charmed (or was it accursed?) circle of common school scholars. To make assurance doubly sure in this connection, it was laid down that "simple policemen, coastguards, and dock and railway porters may commonly be regarded as labouring men. But petty officers in those services, excisemen, pilots, and *clerks of various kinds*, present more difficulty, and must be judged of according to the answers to the preceding inquiries"—for example, Does he rank or associate with the working-men or tradesmen of the place? Thus early (1864) was the sinister rule laid down in England that the state has no part or lot in the education of the middle-class population; whereas, in the case of Switzerland, it was an easy transition from the provision of primary education for all and sundry, to the provision of secondary education for all who were desirous thereof. Hence it transpires that to-day every canton has a complete equipment of educational institutions, from the

Primary School to the Gymnasium,

all of which take whatever form the canton wishes; so that although these may be overlapping to some trifling extent, this is more than counterbalanced by the exactness with which the school and its curriculum meets the wants of the locality in which it is situated.

In Switzerland there are no bewildering cross-purposes between counties and county boroughs as with us. To each canton there corresponds

One Central Authority

controlling all grades of schools, the inspection of which is entirely in the hands of this authority. The common schools of the various communes of each canton are under the ægis of a

Local Authority,

consisting of not less than five members, and appointed for four years by the Communal Council. For purposes of higher primary education, several communes join together in support of a *district school*, which is controlled by a

District Authority

similar in constitution and in mode of appointment to the Local Authority or School Board, as it may be termed, to which reference has just been made.

The middle and higher schools are cantonal, and are supported mainly by the Central Authority of the canton. This is the system that prevails at Bern.

In Zurich the system is much more decentralised, and it is worthy of note that the Central Authority, or Education Department, as we may fitly term it, employs no inspectors, the inspection being done by a local commission, which strikes Mr. Morant as most undesirable, although a Zurich notable, to whom he submitted his notes, claims that the system works well, and that the schools are very efficiently overhauled.

With this carefully-thought-out system—which is (*a*) worked in all details of *direct* management by the nearest possible *local* authority, (*b*) controlled in its general aims and methods by the higher authority of a large district, near enough to be able to gauge local circumstances, yet far enough to be free from undue local peculiarities, and (*c*) supervised, guided, and aided by the Supreme Central Authority, which itself possesses both expert advisers and means of local knowledge; while, at the same time, each school is recognised as drawing its *clientèle* from, and providing for the needs of, a clearly-defined area, increasing in size for each grade of school, from the primary school in each little commune, and the district school in each little circle of communes, to the Gymnasium and Realgymnasium providing for the whole canton—the writer compares our English lack of system, very much to the disparagement of the latter, "where not only are local authorities for each different grade of education usually non-existent, or else lacking in co-ordination of effort, but even the central authority has wholly separate branches for some grades of schools and absolutely no department at all for others."

There are other points upon which Mr. Morant enlarges, which will be more welcome reading to teachers than to laymen, however sound and enthusiastic in policy these latter may be.

The Teacher as Specialist

is recognised and utilised in many ways unpractised and unknown in this country, where an inspector usually has absolutely no knowledge of either the schools or the teachers that he is called upon to appraise, until he has experimented upon the *corpus vile* of the said teachers, who at times are ruined under the operation. In Switzerland

Every Inspector is an ex-Teacher,

as he should be; and well will it be for England when the like custom obtains here, as it does not only in Switzerland, but everywhere else on the Continent. Unhappily, at present this wholesome reform is hardly hinted at. Even teachers have become so discouraged in their attempts to secure this modicum of justice as to make but the feeblest of efforts to secure it.

It is also the custom amongst Swiss school authorities to

Consult the Practical Teacher

upon school policy, and to act upon his advice; whereas in unenlightened England the opinion of the only man who, after all, really knows, is scoffed at, and not infrequently does the expert, after spending twenty or more years in learning his business, have to submit to the impertinent *ipse dixits* of the amateur educationist, who perhaps has not been inside a school twenty times since his school days. "In Bern," we learn, "this [consultation of the expert] is effected by organised and *officially recognised* Teachers' Conferences, in which members of *all* branches of the profession take part, and at which inspectors of the Department are always present.

Grants.

The system of grant allocation in vogue in Switzerland is such as should almost make Lord Sherbrooke *et hoc genus omne* turn in their graves.

Attendance and Attainments Ignored.

This is the sound principle upon which the Swiss proceed. "To him that hath *not* shall be given." Where good results are hard of attainment, there is held to be reason for *increasing* the grant, not for decreasing it. Think of it, ye believers in the yardstick method of gauging the grant to be paid, likewise ye advocates of a penny for this and a shilling for that: "*In all Switzerland there is not a single form of grant which is in any way dependent directly upon the number of pupils in the school (still less upon the number who pass a particular examination), or which directly varies with the good or bad attendance of the scholars, or which recognises payment by results, or varies with results in any form whatever.*" It is high time with us that the

Block Grant came,

and that some of the common-sense with which England is credited began to make itself evident in the dealings of My Lords with popular education. Here is a sample—for which

we are indebted to Professor Scharz—of the wiser Swiss doctrine:—"The greater the efforts made by the small communes to increase the work and results of their school, the sooner they came to the limits of their financial possibilities, and so much the more strongly had the larger social area to intervene and take on itself an ever larger share of the burden."

The Teacher's Salary

is the item which absorbs the greater part of the grant from the Central or Cantonal Committee, and very wisely indeed do the Swiss argue that this is the "*most effective portion of the total expenditure of a school*," since "*the condition and efficiency of the school must depend primarily on the question of salaries, because these largely determine the grade of teaching power obtainable.*" We should like to quote Mr. Morant on the need for more teachers for fifty children in a small school, and therefore in several classes, than for the same number of children, all in the same class, of the town school; but every teacher knows too well the cogency of this argument in favour of a liberal staff for rural schools; hence the wisdom of paying the grant as teachers' salaries, thus removing the temptation, to which there is so much succumbing on the part of ignorant *soi-disant* economists, to relieve the rates by paying a starving wage to Didaskulos. Hear what our author has to say on this:—"It is not in Switzerland, as it still is with us, the greatest of all economies in the hands of parsimonious local authorities to

Cut down the Teaching Staff;

nor are rural salaries kept so *hopelessly behind those of the town schools*, and country folk have a better chance of getting good teachers."

The Civil Service Idea.

It will naturally occur to our readers to ask whether this payment of so large a proportion of the teacher's salary by the state does not constitute him a civil servant. The answer is emphatically no. Here again, then, is a practice that might well be adopted in this country to the betterment of the teacher's position, and to the uplifting of local politics, with no corresponding disadvantage to any of the parties concerned. Our readers will see many other collateral gains in this mouth-watering scheme; indeed, Mr. Morant refers to several, but we need not enumerate them, as sufficient has been said to justify the inclusion of state payment of salaries in the practical teacher's platform.

The Part of the Candid Friend

to the Education Department is played by Mr. Morant to perfection. After citing the very simple principle upon which grants are awarded to Swiss schools, he gives nearly a page of small letterpress as the smallest compass in which can be compressed the merest outline of the system obtaining here in the apportionment of the Government grant, and, sooth to say, it looks fearful and wonderful beside the simple Swiss system of grant allocation. It is pleasant to observe that

Messrs. Gray and Yoxall

are quoted approvingly by the author in connection with their efforts to obtain a wiser mode of procedure in settling the income of a school. Mr. Morant does not lose sight of the fact that "this principle of apportioning grants—

To wit, the Block Grant—

is already actually in working in certain spheres in England. The Treasury grants to university colleges, the education grants of the Board of Agriculture, and most County Council grants to secondary schools, are awarded on this basis.

Real Compulsory Attendance.

Perhaps the most tempting bit of Swiss practice, in the eyes of the English teacher, is that which comes under this head. Every month the number of unauthorised absences standing to the credit of every Swiss boy or girl between the ages of six and fifteen are copied from the registers and forwarded to the police authorities, and a constable forthwith proceeds to interview the parent of the defaulting scholar, his business being to demand a fine for the delinquency, failing which the parent receives a

County Court Summons,

after which "pay or go to prison" sums up the situation in such fashion as to effectually put a stop to unnecessary absence from school. The above account occurs in a description of what Mr. Morant himself saw and learned during an actual visit to a Swiss village, one other selection from which we will make before laying aside—very unwillingly—our pen.

The school had about one hundred and forty children between the ages of six and fifteen. Six is the earliest school age in Switzerland, consequently there are very few infants' departments. The staff consisted of two masters and one mistress, all trained and certificated; there were no pupil teachers. The mistress received a salary of £51, with house, etc.; the assistant-master's salary was £58, with house, etc.; whilst the head-master's salary was about £60, with house, etc. Taking into account the great differences between the prices of commodities here and in Switzerland, these salaries compare very favourably with those given in England, especially when the school hours are taken into consideration. These are as follows:—From April 1 to August 31 in each year, the school is only open in the morning, the afternoon being needed for field work. September and October are holidays. From November 1 to March 31, the school is open from 8 a.m. to 11 a.m., and from 1 p.m. to 4 p.m. These two periods give practically two sessions of one hundred and thirty days each, if Sundays be excluded. The school must be open for a minimum of nine hundred hours for the whole year by the cantonal regulations, and the cantonal grant is then given in full.

If, after studying the Swiss system of education as set out so ably by Mr. Morant, one should be so misguided as to still prefer our English chaos before the Swiss cosmos, then with Mr. Hosea Biglow might he say,—

> "In short, I firmly du believe
> In Humbug generally,
> For it's a thing that I perceive
> To hev a solid vally."

EDUCATION IN MALTA.

BY A CORRESPONDENT.

MALTA, the "diamond" of the Mediterranean, is a British possession worthy of a visit from the antiquarian, the historian, and the statesman; for it contains important relics of the past, and its strategic position renders it a dependency that might well excite covetous feelings in the minds of hostile or even of friendly nations.

It is not, however, our special purpose to deal with Phœnician, Greek, Carthaginian, Roman, or Arabic remains found there, and that show unquestionably that those peoples have successively held sway over the island. Our purpose will be served when we have dealt with Malta during mediæval and modern times; and with regard to the latter, we shall endeavour to give an account of the educational system under which the present generation of Maltese are being instructed.

As we sail eastward from Gibraltar along the north coast of Africa, and while we are charmed day by day with the gorgeous sunsets, and the resplendent nature of the surrounding blue sea and clear sky, our thoughts centre in anticipation on pictures of a bright, green garden, which we have conceived Malta to be. Our approach to the island soon dispels poetic fancies, however; for there, in the glare of the sun, we find—as it seems at first sight—a white, parched rock, the appearance of which is in no way relieved by the square, massive fortifications which meet the eye in almost every direction.

Once landed, and having satisfied our curiosity that the grand harbour of Valetta is indeed a wonderful natural provision for the extensive commerce of the Mediterranean, we make our way to St. John's Cathedral Church and to the Governor's Palace, which places are intimately associated with the history of the Knights of Malta, who

in the sixteenth, seventeenth, and eighteenth centuries held dominion over the island. At the Governor's Palace the armour of the knights and other interesting relics may be seen, and at St. John's the bones of many of these Christian soldiers were laid to rest after many a hard fight against the Turkish hordes who repeatedly endeavoured to take the island out of Christian hands.

One's thoughts must take a serious religious turn when visiting Malta; for, apart from the fact that the actual bay may be visited in which St. Paul was wrecked, the contemplation of the work done for Christendom by the knights with their brave Maltese soldiers fills the mind with gratitude to those heroes who preserved Western Europe during the sixteenth century from the domination and thraldom of Mohammedanism, which threatened at that time to destroy the whole work of Christian civilisation.

In 1557, the knights having checked the Barbary pirates, the Turks ferociously attacked the island; and again in 1565, under Solyman himself, the Turks suffered severe defeat at the hands of the troops of the Grand Master of the Order, La Valette. It is said that more than two hundred knights

A STREET IN VALETTA.

and seven thousand Maltese defenders fell in this last terrible encounter. Some time later, in a ditch near Fort St. Elmo, the bones of the dead were excavated, and these have been used as a grim decoration for a chapel where even at the present day the Maltese solemnly reverence the remains of their departed compatriots. Again in 1571, at the great battle of Lepanto, where the final defeat of the Turks took place, the Knights of Malta and their troops struck a heavy blow in defence of Christianity.

One hundred years ago, Napoleon Bonaparte, notwithstanding the resistance of the Maltese, succeeded in effecting an occupation of Malta, but only to be dispossessed by the British in the year 1800.

During the last hundred years, under British government, the Maltese have been, on the whole, loyal and happy. British trade brings wealth to the inhabitants, and the respect shown to the prevailing religion by the governing power has produced a certain steady loyalty to the British flag. However, it will be admitted on all hands that until recent years the colony was considered almost solely a fortification. Consequently, domestic affairs did not perhaps receive their fair share of attention; but there seems little reason to suppose that British rule, as now administered, will lose any of its prestige in this part of the Mediterranean.

Some twenty years ago a considerable change was made in educational matters in Malta. The islands had then, as they have now, village primary schools, a few higher schools, and the university. The teachers in the primary schools and in the principal Lyceum were not trained, but many able men took part in the instruction, most of which was given in the Italian language. The salaries of the teachers and professors were very low, and the wonder is that the services of such good men were obtained for the scanty remuneration offered. The limited resources of Malta outside the commercial area of life left many conspicuous men with little or no employment, and if these men had not eked out an existence by private tuition, their lot would not have been a happy one. This fact, though it enabled the authorities to get good men at an inferior salary, must naturally have militated against the success of their teaching; for it was impossible for teachers to give their best energies to a set employment when there were other demands on their time and strength. Fortunately, the Maltese live frugally, and domestic anxieties do not press heavily there; hence it was that a good amount of educational work was done under circumstances which would not in this country have produced satisfactory results.

The institution of a Commission of Inquiry into the education of the Maltese led to the appointment as Director of Education of the Hon. S. Savona, who had been instrumental in calling the attention of the government to the inadequacy of the educational equipment. This gentleman—a man of great experience in educational work—directed the school system for several years with energy, skill, and success. Under his guidance, much improvement was made in the salaries of teachers, and several trained teachers were brought out from England to work at the large secondary school or Lyceum in Valetta. Moreover, promising young men and women were sent to England, where they resided for two years in one or other of our residential training colleges; and even to-day there are some Maltese teachers in England undergoing this kind of training.

A natural result of this training in England for the Maltese, together with the coming of English teachers to the island, has been a development of English methods of teaching, and greater attention to the study of English; so that now in Malta, Italian, which predominated, is being relegated to a secondary position. The school buildings in Malta are not structures of which any modern architect would be proud; indeed, there appears to have been no attempt made at any time to erect attractive structures for purposes of education; and even the Lyceum and University, which are contained in the one building, might be passed in Strada Mercanti without attracting the visitor's attention. Good, spacious classrooms, however, are provided within this building, the lower floor of which is used by the students of the Lyceum, who number some three or four hundred. In passing, it ought to be stated, in fairness to the authorities, that all buildings in Malta require to be built with the view of avoiding the great heat of the sun, which is tropical for about six months of the year; so that the providing of cool, spacious rooms is a more urgent matter than the exterior attractiveness of school premises. And as regards sites for schools, the military authorities would have to be consulted, as they naturally require the best positions in and about Valetta for their special purposes.

The primary schools are worked much on English lines, and improvement has been gradually going on for some time, as already indicated. The boys and girls, on reaching the age of twelve or thirteen, can pass on by simple examination to secondary studies. Only a nominal fee is charged for this higher education, and the son of the peasant may be found side by side with the son of the professional man in the Lyceum and University. There are in Malta a few schools which cater for those parents who can, or rather who wish, to afford special advantages, educational or social, and amongst these the famous college of St. Ignatius at St.

Julians must be mentioned. Certainly the boys educated at this college are a credit alike to their country and to their *alma mater*. There is also a good convent school for girls at Sliema, a growing suburb easily reached by steam-launch, and on the opposite side of the quarantine harbour, from Valetta.

A few words describing the course of studies followed at the Lyceum in Valetta cannot fail to be of interest in these days when in England an attempt is being made to organise secondary education. The Lyceum is divided into three sections—*preparatory*, *commercial*, and *classical*. The boys who come on from the primary schools, or from private schools, generally enter the preparatory section, and this is graduated into three or four separate forms. Here, in addition to the general work of reading, writing, and arithmetic, and the like, the boys acquire a further knowledge of English, Italian, and French. Examinations (written and oral) are held annually, and as the boys give satisfaction they are passed on to higher forms, some parents choosing the commercial classes, while others, whose sons are intended for professional careers, attend to classical studies.

There is no hard-and-fast rule, however, in the classification. The Director of Education can, when he deems it advisable, make changes to suit the requirements of the pupils.

The schools open at 8 a.m., and go on till 11 a.m., when till 2 p.m. the pupils are free. Afternoon schools are held generally between 2 and 4 p.m.; but many of the Maltese take private lessons from their school professors, and the school hours here given do not therefore represent the time occupied in education by the more industrious pupils.

Some idea of the extent to which education goes in the Lyceum at Valetta may be gained when it is stated that the higher forms can read with pleasure some of the best and most difficult of our standard poets. Even in the preparatory schools we have heard Maltese boys reading difficult English with ease and expression, and in a way that would put many British boys of the same age to shame.

The Maltese make good students; they are versatile and intelligent. Their own language—a mixture of Arabic and Sicilian—avails them on the shores of the Mediterranean beyond Malta. They readily learn English, and many of them are equally fluent in this and in Italian and French.

A few words of general interest, in conclusion, may be useful to those who contemplate a visit to the Maltese islands. As we are all fond of seeing soldiers and sailors, our tastes in this direction can be satisfied to the full extent here; and should it be a visitor's good fortune to be in Malta on the occasion of the celebration of the Queen's Birthday, he will witness a sight that will excite his feelings of patriotism to intense enthusiasm. On this day the high forts encircling the grand harbour are lined with white-helmeted troops, who at a given signal fire a *feu de joie*, while the guns of the forts and of the fleet thunder forth deafening salvos proclaiming Britain's might. Probably no place in the British dominions affords such advantages as Malta for a military display of this kind.

But the sun begins to get very hot in May, and most of the visitors have returned after their winter sojourn. There are, however, troops always coming and going; and every week, while the governor of the islands is at the palace in Valetta, the trooping of the colours takes place in St. George's Square, opposite his residence.

During the season, too, the Royal Opera House provides suitable theatrical entertainment, the operas being, as a rule, performed by Italian companies.

Just before the commencement of Lent a few days' *carnival* is held; but this is not a display which improves one's artistic tastes, and generally resolves itself into a series of uncouth processions, in which are carried effigies of unpopular personages. Still the holiday makes a commotion, and when one is far from home he welcomes any distraction which is at all tolerable.

Living is fairly cheap in Malta. Fruit there is in abundance. Apricots, melons, green figs, and other like dainties, may be had at a price that would bring ready ruin to an English fruiterer. There is no need for an inspector to follow the wily milkman on his rounds, nor for the milkman himself to be burdened with the cleansing of utensils; for the goats are milked at your door, and there you receive the unadulterated liquid at a very moderate price.

There is every facility for locomotion in and about Valetta. A railway runs from Porta Reale, the entrance to the city, to Citta Vecchia, the old capital, in the centre of the island. Steam-launches and boats are plentiful, and not the least interesting mode of conveyance is the light "four-wheeler," the hire of which is reasonable, even inclusive of a little natural extortion.

LONDON'S POLYTECHNICS.

IV.—THE POLYTECHNIC, REGENT STREET.

VISITORS to the Regent Street Institute—and their name is legion—would be soulless were they not moved to admire the magnificent work that is being accomplished by this all-embracing and rightly-named Polytechnic, for which the fifteen thousand members thereof have to thank the prescience, no less than the munificence, of Mr. Quintin Hogg, the genius of the place, who, seeing life steadily and seeing it as a whole, has not fallen far short of success in providing for every healthy activity that a whole life free from viciousness could desire.

To contemplate the self-devotion of the young Etonian, who in his efforts to better the condition of the London *gamin* did not stop short of sharing the lot of the precocious, but not too virtuous, specimen of humanity, even to sleeping in arches, and feeding on "a pint of thick and two door-steps"—as two slices of bread and treacle and a cup of coffee are called in thieves' vernacular—is distinctly inspiring. A hundred and fifty thousand pounds in hard cash is the price that Mr. Hogg has paid for the privilege of brightening thousands of dull lives; but this is as nothing in comparison with the wealth of sympathy that has prompted him to forsake, not only luxury, but even comfort and ordinary necessities, in order that he might write himself down as one who loves his fellow-men. To us there is something eminently noble in the achievements of Mr. Hogg and his coadjutors, extending far beyond the mere establishment of an industrial and commercial university. Surely we have the age of chivalry still with us, the croaking of the *laudator temporis acti* notwithstanding; and Mr. Quintin Hogg, in his tattered New Cut rags, blacking boots to whiten souls, is a truer *preux chevalier* than was ever Cœur de Lion in his bravest panoply of war. We would fain set out the history of the rise and development of the Polytechnic from its first beginnings in the Adelphi arches, even to its culmination in the Regent Street palace, but space will not suffer it to be so now. Let us then turn from this fascinating picture of the merchant prince's wise munificence, and proceed to give some account of the much-loved Polytechnic as it exists to-day.

When you go to the Polytechnic, you ask for Mr. Robert Mitchell as a matter of course, for he is the representative of all the thousand and one interests that are summed up so tritely in the word Polytechnic. What Mr. Mitchell does not know about the Regent Street Institute is not worth knowing. His was the busy brain that plotted out the plan of campaign that was to be followed, when, in 1881, Mr. Hogg bought the old Polytechnic, and decided that it should be a centre of inspiration to all good craftsmen. The fact that this plan was adopted by the Technical Education Board as the model for all London Polytechnics is in itself sufficient proof of the excellence of Mr. Mitchell's scheme. It was resolved at the outset that there should be no place in the Polytechnic workshops for the mere amateur. All members of the industrial classes must be *bonâ fide* workers actually engaged in the pursuit of their calling. This sapient determination has had two admirable results. In the first place, the confidence of both employer and worker has been obtained, there being no room for fear that the Polytechnic will increase competition by encouraging the amateur to get enough skill and knowledge to pose as a worker of experience. In the second place, the teaching

has been concentrated on the real worker, who has benefited by getting a general idea of his craft as a whole, and by further improving his skill in his own particular branch of the trade.

Upon our arrival at the Polytechnic, whilst awaiting the appearance of Mr. Mitchell, we amused ourselves by making a collection of the various handbills relating to pending events. In order that the reader may have some idea of the many-sidedness of the work carried on, we may quote the subjects referred to in this little collection of Polytechnic literature:—1. Polytechnic Popular Saturday Entertainments, Queen's Hall, Langham Place, where, for sixpence, you can have an evening's entertainment of a truly *recherché* character. To say that the programme in question included the names of Miss Esther Palliser, Madame Belle Cole, Mr. Thomas Thomas, and Mr. Charles Tree, suffices to show how well the Polytechnic goes about the provision of pleasant Saturday evenings. 2. Next we came across an announcement concerning the Polytechnic Dinner Fund for the Poor, which is a fund to which contributions are made by all sections of the Institute, both day and evening—the result being a goodly sum, which ensures many glad Christmas firesides. 3. St. John Ambulance Lectures. 4. Brass-finishing. 5. Ladies' Garment Cutting on Tuesdays, and Gentlemen's Garment Cutting on Mondays and Thursdays. It was on Monday that we paid our first visit, and we were greatly interested in the way the budding West

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End cutters handled their chalk and scissors and their peculiar L-shaped rulers. This class is in high repute. It is under the tuition of Mr. J. P. Thornton, himself a noted cutter, capable and willing to convert your thirty-shillings-a-week tailor into your three-guinea cutter. Small wonder then that the thirty-shillings people come in their hundreds. The position of the Institute, situated as it is in the heart of the West End trades, renders it uniquely suitable as a centre of improvement for workers of this description. 6. Solid Geometry and other Science and Art Department subjects, the Polytechnic being one of the largest science schools in the kingdom, as might have been guessed. 7. A Special Course of Instruction in Hindustani, by a competent native professor. French, German, Italian, Spanish, etc., are provided for in numerous sections and subsections, of which we need not speak. 8. Metal Plate Work. 9. 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After the Art School announcement came the bill relating to the Polytechnic Friendly Society, one of the most successful of its kind. A member may retain membership even though he may cease to be a member of the Polytechnic. The invested funds amount to £2,250. 15. The Polytechnic includes a School of Architecture, and this was the subject of the next announcement. Mr. Charles Mitchell is the presiding genius of this section, which is second in importance to none of the other many features of Mr. Hogg's Universal Provider. 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12. Cookery Class.

and successful, as is the case with everything taken in hand at the Polytechnic.

Whilst we were thus engaged in sampling the literature relating to the classes, Mr. Mitchell had instructed one of his assistants to see us round; and so we began our pilgrimage, which lasted for a couple of hours, during which time we visited upwards of a hundred rooms, and had interesting chats with most of the masters, who vied with one another in satisfying our craving for knowledge. The "gym" is, of course, a popular resort, drill being in full swing at this time. It was easy to see why Polytechnic athletes carry all before them, the earnestness of everybody being conspicuous. From the "gym" we were piloted to the Chemical Laboratory, which is nothing like so spacious and up-to-date as those to be found at Chelsea and Battersea; and the same applies to the Physical Laboratory. Evidently this is due to the newness of the younger polytechnics, which have been able to do exactly as expediency prompted; whereas the Regent Street Institute had to do its best with the rooms that were ready to hand, and a right royal best this has proved. We will not weary our readers with the information that we gleaned from Mr. Rogers, amongst his engines and dynamos; from Mr. Campion Pope, amongst his staircases and balustrades, of which he was so justly proud; nor can we pause to say how pleased we were to see the *men* of the Nursing Class so deftly turning their hands to bed-making, to say nothing of the bandages that were rolled and unrolled and swathed round supposititious sprains. It is enough to say that, in every department and in every section, we found earnest and enthusiastic students doing the right kind of work in the right way, the upshot of which will be the setting of the seal of the Polytechnic upon many of our industries. We must, however, find space to say a few words in recognition of the beautiful specimen of colour printing that was presented to us by Mr. Brennen, who is responsible for the practical part of the printing instruction. It is no exaggeration to say that the various specimens would do credit to the most accomplished craftsman working under the most approved of good conditions. Here we were delighted to learn how popular the Polytechnic is amongst the disciples of Gutenberg, the master printers being in every case willing and even anxious to supply the classes with such material as is needed for the enlightenment of the young printer. In this way, ink was supplied by Messrs. J. Kidd and Co., process blocks by the Caxton Type-founding Syndicate, and three-colour printing blocks for the colour printing by Messrs. André and Sleigh. It augurs well for the usefulness of the Polytechnic, as well as for its popularity, that master printers should so willingly supply the needs of the students. But it must not be thought that this is an isolated case; rather should it be recognised as typical of the attitude of employers all along the line towards what they recognise as a real industrial university.

Much more might be added as to the ramifications of the technical classes, but we must turn to the social side of Mr. Hogg's Palace of Delight, as this looms much larger in the Regent Street programme than in that of any other polytechnic.

From the very beginning of his attempts, Mr. Hogg, like the true apostle of sweetness and light that he undoubtedly is, recognised that

> "Books cannot always please, however good;
> Minds are not ever craving for their food;"

and so he set about providing physical exercise and recreation for his "fellows," which he consummated in such a goodly array of clubs, societies, and functions as to leave no healthy taste uncatered for, no legitimate longing unsatisfied. The most casual reader of athletic news must have had frequent proof of the prowess of the harriers, the cyclists, oarsmen, footballers, and swimmers who hail from the Polytechnic, and who delight in the name of their *alma mater*. Then we have the various learned societies, which afford recreation of a high intellectual order. Of such kind are the French and the German societies, to say nothing of the vigorous Polytechnic Parliament, wherein budding legislators may win their spurs, and be stimulated to win higher renown in "another place" not make-believe. The library contains upwards of eight thousand volumes, and it is a treat to see the business-like way in which members are supplied with their favourite authors. The reading-room is interesting in itself as well as for the wealth of periodical: that it provides for its *habitués*, seeing that it is extemporised out of the swimming-bath, which, unable to perform its proper function in ministering to the body in the winter, is constrained to minister to the mind, on the sound principle that nothing must lie fallow at the Polytechnic. Much ingenuity has been shown in draping the bath, the identity of which is very successfully concealed behind luxurious curtains and soft carpets, the result being a reading-room replete with every comfort and convenience. Nobody knows better than the founder of the Institute that a crowd is not company, hence he endeavours to know all his "fellows" personally, to which end he holds periodical reception meetings, to the end that he may become acquainted with the members, and especially with the secretaries of the various clubs; for, remembering his own playing fields at Eton, the founder-president likes to encourage a robust love of sport amongst the Polytechnic "boys." And talking of playing fields, what magnificent playing fields have been provided for the Polytechnic athletes, in the shape of the cricket and football ground, Merton Hall, Wimbledon, extending over no less than twenty-seven acres of land, admirable alike in situation and in suitability. Then, again, the boathouse at Chiswick is a model of completeness, offering greater facilities for practice than perhaps any other house on the river. It is pleasant to note, in these days of dread lest young England should develop nothing but muscle, that many of the most successful athletes are members, and busy ones withal, of one or other of the societies that cater for the intellectual side of man.

It would be unpardonable if we were to omit mention of the most recent of Polytechnic triumphs—to wit, the foreign travel department, which has been the means of transporting thousands of Britishers, hailing, some from the remotest corners of our island, to lovely Lucerne, to Norway, to the Canary Islands, and indeed anywhere and everywhere where pleasure and profit are to be had, the business of the Polytechnic being to ensure the having thereof at the minimum of cost to the travellers. To such huge dimensions has this latest departure swollen, that the resources of Mr. J. E. K. Studd, the ex-university and county cricketer, who is now honorary secretary of the travelling department, are taxed to the uttermost. We can speak from experience of the excellent way in which the Polytechnic looks after its clients in respect to travel, as we formed one of a Swiss party some few seasons back. It warms the heart of the Polytechnic member to see the name of his London *alma mater* welcoming him as he sails across Lake Lucerne to Seebourg, the beautiful suburb of Lucerne in which is situated—and only those who have been there can realise how beautifully—the Swiss home of the Regent Street institution, the Polytechnic Châlet.

It is not surprising that there should arise a Polytechnic day school, and that this school should emulate the vigour of the parent organisation. Mr. Mitchell, as director and educator, must take pleasure in contemplating the secondary school of six hundred scholars, whose existence is a striking witness of the esteem in which men hold the Polytechnic and all its works; and certainly the school, like everything else that emanates from the Regent Street success-compeller, is doing yeoman service in providing a well-thought-out technical equipment for youths who ultimately will become originators or managers of industrial undertakings.

Nor is this day school the only offshoot from the parent institution. More important than even this is the Young Women's Polytechnic, over which, as is most fitting, Mrs. Hogg presides, and which in its turn has its numerous classes, clubs, and societies, whereby the life of many a lonely shop-girl is beautified and utilised to the lasting advantage not only of the shop-girl, but also of the community at large. In its turn, the Women's Polytechnic has given birth to a flourishing day school for girls, the attendance whereat is upwards of two hundred. And so one might go on enumerating development upon development of this wonderful all-embracing Palace of Delight, but enough has been said to show the ramifications of the place, where you can get your boots blacked, your hair cut, your body de-

veloped, and your mind improved in whatever direction you may desire; where, moreover, such a choice of diversions is presented at such ridiculously low prices as make it doubtful whether so comprehensive a scheme for satisfying every possible human activity and aspiration is provided anywhere else in the wide world.

And now a word as to the spirit in which the work is carried on. "The Lord is our strength" is the motto of the place, and it sufficiently indicates how close is the connection between life and religion as they are understood at the Polytechnic. Here, indeed, *laborare est orare;* and yet there is no attempt at forcing religion down one's throat. Rather is it attempted by the Polytechnic people to live religion, and to spread it by a demonstration of the beauty of holiness as shown in the life of the student, the athlete, or the artist, who is all the more a good craftsman and a good fellow because he is also good in the religious sense. It would be difficult to do aught but admire religion as it is understood and taught here. On Sunday afternoons the Great Hall is filled with young men, who are entertained by all sorts and conditions of preachers, from the Archbishop of Canterbury to General Booth, for the Polytechnic is common ground whereon meet all creeds. On Sunday evenings are held receptions of the various clubs, which are highly popular. To give some little idea of the way in which the world wags at the Polytechnic, we give below a copy of "Coming Events," as announced in a recent number of *The Polytechnic Magazine*, a bright little weekly, to fill which with Institute gossip is a very easy matter indeed.

COMING EVENTS.

Wednesday.—Parliament in the Marlborough Room, 7.45. Physical Development Society, in Room 42, at 8.30. Photographic Society, in Room 14, at 8.15. Sunday Service Choir meets in Room 39, 9 to 10. Dorcas Society, in the King's Weigh House, at 8.

Thursday.—Photographic Society, in Room 14, 7.45. Shorthand Society, in Room 16, at 8. Prayer Meeting (in special connection with Sunday afternoon service), Room 39, 9.15 to 9.45. Total Abstinence Society, Small Lecture Hall, 8.30.

Friday.—Our honorary dentist, Mr. A. Ovey, as on Monday (young women only). Bible Reading in Great Hall at 8.15. Military Band Practice, Foley Street Grammar School, Titchfield Street. Select Choir meet at King's Weigh House, at 8. Old Quintinians' Cinderella.

Saturday.—Concert in Queen's Hall (sixth of series). Football at Merton Hall. Ramblers, Avenue Exchange of the National Telephone Company, meet outside Lime Street entrance.

Sunday.—Service for Young Men only, in Great Hall, 3.30. Address by Rev. Dr. Clifford; orchestral accompaniment to hymns; singing by boys of the London School of Choristers. Service for Young Women in Sisters' Institute, at 3.30: Mrs. Quintin Hogg. In Great Hall, 7 p.m., Service open to all: Mr. A. Williams. Tract Band Prayer Meeting, Room 15, at 5.30. The Harriers, "At Home" in the Marlborough Room after the evening service; members of either Institute cordially invited.

Monday.—Polytechnic Friendly Society: members enrolled from 8 to 9.30 p.m. in entrance. French Society: "Edward III.," Mr. Sheldrick; "La vie militaire," Mr. Redgate, Room 42, from 8.30. Christian Endeavour Society, Room 39, at 8.30. Our honorary dentist, Mr. A. Ovey, 17 Orchard Street, W., can be seen between 9 and 11 a.m. on production of member's ticket (young men only).

Tuesday.—Mr. Shewell-Cooper, Barrister-at-Law, attends from 8 to 9 p.m., to give *free* legal advice to any member. West London Rifle Volunteers at headquarters, 8 p.m. Shorthand Society, Room 16, at 8. Military Band Practice, Foley Street Grammar School, Titchfield Street, 8. Mutual Improvement Society: "Our Commercial Supremacy." The Secretary. German Society: Open Night, Room 42, 8.30.

"What we wanted to develop our Institute into," said Mr. Hogg on a recent occasion, "was a place which should recognise that God had given man more than one side to his character, and where he could gratify any reasonable taste, whether athletic, intellectual, spiritual, or social." We think, dear reader, you will agree with us that Mr. Hogg—as he passes, as is his wont, from his home in Cavendish Square, through the covered way that has been made to render it possible for the founder-president to visit his fellows in all seasons, to his much-loved Polytechnic—can console himself with the thought that he has more nearly materialised his ideal than the most sanguine of men could have thought possible. It is pleasant to note that since the advent of the Technical Education Board the Charity Commissioners have made a yearly grant of £3,500, which has relieved the founder of the financial burden that he so nobly bore for so long a period. But nothing short of death will ever separate Mr. Hogg from his Institute, in which he spends the greater part of his leisure; and surely, after death, he will have his reward in being one of the immortals of whom it is written—

"To live in hearts we leave behind
Is not to die."

"OUR TEACHERS."

MR. CLEM EDWARDS, the "clever little gentleman" who acted as special correspondent of *The Daily News* at Cambridge, has been regaling the readers of his paper with an account of the calibre and characteristics of the teachers he met at the N.U.T. Conference. So keen and amusing are some of his comments that we are prepared to stand the terrible charge of being "behind the time" rather than forego the opportunity of giving our provincial readers the pleasure of reading them.

A Study in Physiognomy.—The first thing that strikes me is the definite type of face being evolved in the schoolmaster. It is as unmistakable as the legal face or that of the cleric. Its expression may be described as the intellectual clothed with the frigidly severe. The pale cast of thought of the student is shot with the professional sternness of the drill sergeant. There is not a sign of the flippant to be found—not even when seen in the ball-room. The face is eloquently expressive of rectitude, but of the unctuous there is no visible evidence. In repose it is almost statuesque, and the animation is upon the principle of limited liability. The schoolmaster's smile is a grave act of calm deliberation. It is not provided for in the codal time-table, it is true; but it is treated upon the same basis. The facial expression of the schoolmaster is the outward and visible sign of the disciplinarian. The constant addiction to an expression has produced "a set form." Nurses frighten children who make grimaces by telling them that unless they desist their faces "will become set like that." In this the nurses think they are diplomatic; that is to say, they believe they are lying in their professional capacity. They are doing nothing of the kind. They are speaking the truth without knowing it.

From a Sartorial Standpoint.—Sartorially the schoolmaster stands as a race apart by himself. His dress is a compromise between that of the city clerk and the country squire. A sense of social duty seems to prompt an expansive display of white linen and a silk hat. The silk hat is regarded as irrefutable evidence of status, and quite as necessary to professional salvation as the parchment certificate. But the sartorial demands of the profession have their limitations. The silk hat marks the longitude and the cuffs the latitude. After them comes the Englishman's sense of comfort. This gives the frock-coat the go-by, and expresses itself in lounge coats of tweed and variegated dreams in the way of unmentionables. Thus sartorially the schoolmaster has compromised between comfort and appearance.

What am I to say of the schoolmistress? The subject of ladies' dress is a delicate one. If the truth is along the lines of adverse criticism, the task can only be performed by the boldest man—or another lady. But I am glad to say that the tastes of the schoolmistress, as manifested at Cambridge, are almost coincident with my own. Of course she varies her dress to suit the occasion of the moment. Perhaps she takes the Conference business a little too seriously, judging by her contempt for colour. Indeed, the dresses put on for the discussions were sufficiently severe and colourless for early morning school. But the festal garments were a rich compensation. The colour and beauty of the dresses of "the dinner" charmed me. The sartorial adornments were admirable, too, in the gorgeous procession which filed along the platform, presenting the purses to the Vice-Chancellor's wife. But these were mere preludes to the scene at the Conference ball. The ball-room presented a rich variety of artistic and womanly taste, in the charming display of beautiful dresses made by the schoolmistress.

As Public Speakers.—The teachers can boast a perfect plethora of fine speakers. A higher level of debating power than that reached at this Conference I have never come across. Of course a school is sufficiently removed from the proverbial

field of cabbages, and sufficiently near "a real audience" to make the pedagogue's daily practice most helpful. The coercion of the suspended cane secures attentive listeners, and even a compulsory audience is as good for a young speaker as a life-belt for a youthful swimmer. The schoolmasters, however, do not appear to possess any great orators. Dr. Macnamara is the nearest approach. But his passion for proving his case with statistics is an obstacle in his way. A great orator leaves much to the imagination. Dr. Macnamara leaves nothing—except one's desire to know where he gets all his telling facts from. That he will, doubtless, continue to leave untold—for he is a journalist.

Faith in the Democratic Future.—It is perhaps in the free and easy talk of these social gatherings that one gets the best idea of the calibre of people in a movement. I have had many such talks during the week. I am immensely struck with the high character of the elementary teachers of England and Wales. They nearly all have a profound sense of the greatness of their mission in educating the democracy. Their genuine enthusiasm for education comes out at every point. Their mental calibre strikes me as being very high. Their political power is, of course, very great. They are conscious of it, but their keen sense of responsibility will cause them to use that power wisely and well; of that I have not a shadow of fear. Constrained though they are by their training and daily duty to look stern in social life, I find both masters and mistresses possessing all the high qualities of delightful companionship. In a word, my week's sojourn among the representatives of our elementary teachers charged to educate the children of the people has done much to confirm my profound faith in the future of our country.

CYCLING FOR THE HOLIDAYS.

IN proportion to its numbers, the teaching profession contributes at least its fair quota to the total of fourteen million cyclists which it is estimated is the number of wheelmen and wheelwomen in existence to-day; and there is very good reason for this, seeing that "the rolling circle's speed"—to misquote the poet Gray—is just the best antidote to the "intolerable strain" of the schoolroom. Hence it is that the "bike" becomes a very important item in the holiday impedimenta, and that the "biking" article takes its place, as a matter of course, in THE PRACTICAL TEACHER'S Holiday Contributions.

The Machine.—This should be of good quality, to ensure which the uninitiated should insist upon having a bicycle carrying the "transfer" of a good firm. Teachers may get good terms and good counsel—to say nothing of a good lunch—from Colman of Woking, whose "Fairy" of the second grade, selling at £9, 10s., can be recommended as excellent value for the money. The Rudge-Whitworth Company also are this year supplying a first-class machine for ten guineas; and hosts of other firms have reduced their prices very considerably as compared with the fifteen or twenty guineas which, in the not very distant past, was the minimum cost of a decent machine.

The Gear.—This should not be too low. Ladies, in particular, made a great mistake in riding a machine geared up to about 56, when they could just as easily ride one with a gear of 66. For a gentleman in fair condition we recommend a gear anywhere between 66 and 80. Gear-cases are a questionable boon, as is shown by the fact that few seasoned riders go in for them nowadays. Provided with a proper chain lubricant composed of a lubricating oil and blacklead, the cyclist can bid defiance to the muddiest roads, and this, too, without the disquieting rattle-box accompaniment too often inseparable from the gear-case.

The Tyres should be first grade, and should ever be kept well pumped up, since it is the tight tyre that goes fastest and lasts longest. Nothing is more exhausting than riding on a flabby tyre, and nothing conduces so certainly to the justly-dreaded puncture. In this connection, however, there is one very necessary caution to be observed, in hot weather especially. If the tyre is pumped up to its hardest in the cool of the morning or evening, the expansion due to the noonday heat will often suffice to explode the tyre, as the writer, in common with many other faithful brethren of the wheel, has learned to his cost. The remedy is simply to pump up when the heat is greatest, and to put in a few additional "puffs" when riding in early morning or late at night, which excess of air can be let out as the heat increases.

In order to effectually preserve the elasticity of the tyre, it is recommended by the faculty that the tyres should be washed down not more than five or six times per annum with water containing a small proportion of alkali, such as soda.

Side-slip looms large in the list of things to be dreaded by the devotee of the wheel, and justly so, for few indeed are the fortunate ones who can lay claim to immunity from disaster, small or great, under this head. Side-slip is frequently due to unequal pedalling, and that most of us do pedal unequally may easily be shown. The inequality may be corrected by accustoming oneself to ride without holding the handle-bars—a feat very easy of accomplishment, and useful in many other ways than as mere display. It is impossible to pedal unequally with both hands free, and the art once acquired in this fashion is always practised, whether grasping the handle-bars or no. Toe-clips are helpful in this connection, and, in addition, it is wise to firmly grasp both handle-bars when riding over slippery roads. If, after all your precautions, you *do* slip, you may console yourself with the fact that you are but one of many, and you may perhaps acquire the very useful art of falling gracefully and harmlessly.

Repairs.—It is one of the many compensations of cycling that it creates within you a very proper respect for the skill of the mechanic, and it may even impel you to beget a respectable modicum of mechanical skill yourself—of which, by the way, do not be conspicuously proud, as is the wont. It is related of the Prince of Naples—an ardent wheelman—that he has had a repair-shop fitted up on the premises, in order that he may do his own repairs, and presumably those of his sisters and his cousins and his aunts. Compare this with the helpless one who pays twopence to have her tyres blown up, and strike the happy average between these two extremes, if you would do your duty as a true brother or sister of the craft. You should be able to mend a puncture, and to do all the things necessary thereto, such as taking off and replacing the tyre and adjusting the valve. You should also learn how to adjust your chain, as danger lurks in an unduly slack chain; and if, in addition, you can go further and learn how to adjust handle-bars, wheels, etc., you will not only save yourselves money, but you will also avoid much discomfort in riding, which the ignorant regard as part of the game, but which the initiated will not tolerate at any price. To be able to do as above suggested, you must habitually carry with you the usual accessories, amongst which a *repair-outfit* will find an honoured place.

The Speed.—The record for one hour, held by H. Elkes, is 34 miles 1,220 yards. The wise wheelman will not envy the misguided man this fearful and wonderful pace, but will content himself with about one quarter of this 34 odd miles per hour, whereby he will run no risk of putting his heart out of sympathy with him—for it is upon this never-resting force-pump that the strain of scorching falls. And if scorching along the level is to be tabooed, what shall we say of the witless wight who scorches up precipitous hills, seduously intent upon driving nails in his own coffin without gaining aught by way of set-off!

Touring.—If the bicycle does not annihilate space, it does bring distant places and persons appreciably nearer; and with the many excellent road-maps now obtainable, it is possible for the cyclist to journey whithersoever his fancy prompts, with every prospect of a speedy and pleasant transit. Should you sigh for Continental campaigns, you may realise the desire of your heart without let or hindrance, even if your equipment as a linguist is of the slenderest. THE PRACTICAL TEACHER has already (July 1898) outlined a delectable tour in Normandy, which was sampled by a practical teacher in the interests of the readers of this magazine. In our January number Mr. Mieille held out the right hand of welcome, as well as of direction, with respect to the Pyrenees; and to-day we further offer descriptions of tours in Ireland and Scotland; and we shall gladly further advise the inquisitive as to the What and How of these wanderings awheel in foreign parts. To show what can be

done, it may be mentioned that two practical teachers last year toured from Hamburg to Berlin and back again, by way of Brunswick, Magdeburg, Hanover, etc., through Holland, riding upwards of nine hundred miles in seventeen days, seeing much and learning much as to the real condition of the German of all classes, and returning, in the case of one at least, without even so much as a puncture. And, lest it be retorted that it is only the young and lusty who may hope to go so far afield, it may be added that each of the tourists in question was on the wrong side of forty. If you should resolve to follow up the trail of our two travellers, and, like them, hope to see German schools *chemin faisant*, it will be well for you to know that it is no easy matter to obtain a permit to enter a school in the Fatherland; so that application to the consul or ambassador should be made before the tour is entered upon, otherwise this part of your campaign may—indeed will—remain unaccomplished. It will also be useful to know that German schools resume work about the middle of August.

Guide-Books.—These may be obtained from Messrs. Philip and Son, 32 Strand, who supply foreign as well as English maps and guides. The best French guides are those published by the Paris agents for this journal, Messrs. Neal, Rue de Rivoli, and known to all French cyclists as the Plan-Velo series. It is economical to buy only those maps that are mounted on linen.

With these few words by way of send-off, we will leave our readers to the perusal of routes, just pausing to wish them *bon voyage*, with immunity from side-slip, punctures, and all the ills that cycling flesh is heir to.

THE PRACTICAL TEACHER ON WHEELS: V.—IRELAND.

BY W. J. SPURRIER.

If you desire to go among a most hospitable people, to cycle through ever-changing scenery, pretty, luxuriant, and grand, some of it indescribable in its natural and rugged wildness, go to Ireland. If still other attractions are required—such as change of scene, good roads, and fair charges—again I say, go to Ireland. You will be treated with the native courtesy, and will find yourself in a perfect cycling paradise. It is the luxuriant foliage, growing everywhere in the greatest profusion, that gives the peculiar charm to Irish scenery, and has caused the island to be called the "Green Isle." The habits and customs of the Irish peasantry are so fresh and quaint to the Saxon eye, and the "brogue" is so pleasant to the ear, that all who in the coming season are able to visit with their wheels the rugged hills, sylvan vales, romantic glens, and fertile plains of Ireland, should make their tour as lengthy as possible.

Those who make holiday in Ireland should acquaint themselves with a few maxims. Irish miles are somewhat longer than those on the other side of the Channel, four Irish being nearly equal to five English, and, to make them still longer, the native's five miles may actually mean ten. Daily distances should be arranged well within the cyclist's powers, as hotels are often few and far between, and in case of a breakdown the railway station may be twenty or thirty miles away.

Dublin is certainly the centre of attraction, so it is well to sail for that port or to Kingstown. Should the starting-place be the banks of the Thames, you may take an enjoyable voyage of six hundred and sixty miles, or may choose the shortest possible passage. Arrived at the city on the Liffey, there is much to be seen besides Sackville Street and Phœnix Park. Although the roads around are not of the best, there are many places which should be visited—through the Park to Knockmaroon; along the Liffey to Leixlip, noted for the salmon leap and fine cascade; Swords, with its round tower and castle ruins, out north; to the south, Bray, and the famous Powerscourt: this latter is said to present the "most luxurious feast of scenery" in the country, *par excellence* for delightful rural prospects. Howth and Ireland's Eye, Kingstown, Dalkey and Killiney, and a longer run to Blessington and the charming Falls of the Liffey at Poulaphuca, should all be included.

Those who select the long tour had best steer northwards to Dundalk; then Newry, for the tour round the Mourne Mountains, which develop very striking varieties—ridge after ridge, peak after peak rising in constant change of formation. Several singular chasms, some sixty feet deep, but only a few feet broad, are passed on the way to Newcastle. To Belfast is another good day's ride. The capital of the north is a large and busy place, on the river Lagan, at the head of Belfast Lough. From here is one of the grandest rides in the country, round the coast by Carrickfergus and Larne (the port of arrival for visitors coming from Stranraer). Thence there is a splendid road, following the sea-line, winding round the promontories, and passing Ballygally Head, the first fine group of basaltic pillars you meet with. The road continues through most interesting scenery, by the Gothic castle of Glenarm and Garron Tower, to the pretty village of Cashendall. A mountainous and almost uninhabitable region is then traversed to Ballycastle. At this little seaport, time permitting, there are many of nature's wonders to be seen—the "Grey Man's Path," Benmore and Kenbane Heads, and Rathlin Isle.

Starting for the Giant's Causeway, there is a three-mile hill to mount for Ballintoy, near to the far-famed hanging bridge of Carrick-a-rede, which is too risky to venture upon. Another hill and the Causeway is soon reached, with its "Lady's Fan," the "Giant's Chair," "Bagpipes," and many more wonderful formations, to see which it is well to fee a guide, and form an opinion after, not before, you have seen these peculiar freaks of nature. After a thorough inspection of all the basaltic wonders, not forgetting the "Giant's Amphitheatre," said to be the most beautiful of the kind in the world, you steer for the Mills-on-the-Bush. Here there is a stretch of magnificent coast scenery, by Dunluce Castle, with its cavern and narrow arch approach, to Portrush, a place of some fashion and good accommodation.

A return from here may be made by way of Ballymoney and Antrim to Belfast, but a fine piece of coast road (the inland road is very difficult) leads to Derry. The walls of Londonderry are much as they were at the great siege, but the city has grown beyond them: a week or more will not be too much to devote to the magnificent cliff scenery. From Derry there are two courses to choose from—to do the Donegal Highlands thoroughly, or take one of the following routes. The coast scenery cannot be surpassed for picturesque beauty, *viâ* Letterkenny, Dunfanaghy, Gweedore, Glenties, Carrick, to Donegal. That would occupy two, three, or four days; the direct and shorter way only requires one long day, and is by Strabane, Stranorlar, through the Gap of Barnesmore, to Donegal. Both are over mountain roads, with many ups and downs. On the next stage you have an entire change of scene, and should go to Sligo, *viâ* Ballintra, Ballyshannon (famous for its cataract and salmon-fishing), and Bundoran (with its splendid sea-bathing). Beautiful Lough Gill should be visited, and the tour continued round Ballysadare Bay, skirting some large bogs, through Dromore to Ballina. From this point it is well to make for Pontoon Bridge, Lough Conn, Castlebar, and Westport, at the head of the bay.

I cannot leave this most western port of Ireland without recommending a visit to a wondrous little isle. A twenty-two mile wheel, by Newport, round Clew Bay, lands you at the new swivel bridge over the Sound, in Achill Island. Nine more miles and the "colony" of Dugort, at the foot of the Slieve More, is reached. From the summit of the "Sugar Loaf Mountain"—the ascent is an easy one—there is a magnificent panorama, embracing views of the whole of Croaghpatrick, and of Clew and Blacksod Bays—the Erris Hills and the village called "Duoch-lay-am" being at the foot. The seal caves are a great attraction, and it is necessary to charter a boat to pass over the great green rollers of the Atlantic, which break with a dull roar at the portals of the caves. At the approach of the boat the seals dive under, and the water being as clear as crystal, you can see the dark forms glide swiftly by. The "Cathedral Cliffs" (craggy precipices almost a thousand feet high), the village of Keel, the "Achill Diamonds," "Golden Eagles," and the "Mermaid's Looking-Glass" are some of the wonders. One of the grandest sights imaginable is that presented by the stupendous cliffs of Croghan; the ascent is a gradual slope, and it is not until the summit is attained that an inkling is gathered that you are on the verge of a sheer precipice of over two thousand feet. To get a glimpse of this sublime scene, it is safest to lie down and peep over. Here, besides eagles, are wild goats, and possibly a chough or two; and into the bay come whales, sharks, and salmon, on their way to the rivers. I must leave the tourist who has the time to spare to exhaust the wonders of this "treasure island," and steer away for Connemara. If, however, it is desired to at once turn homewards, Westport is a railway terminus, or the roads are very fair by Roscommon and Mullingar to Dublin.

Of Connemara Thackeray said: "It is one of the most wild and beautiful districts that ever it was the fortune of a traveller to examine." The best way to realise the truth of this is to proceed over Derrycraft Bridge, Leenane—the "Pass of Salruck" near, with unsurpassable views of the Atlantic—through Mylemore Pass, by the Twelve Pins, Recess, Oughterard, on Lough Corrib, to Galway. The steamer should here be boarded for

Ballyvaghan, the "corkscrew" road ascended, and then the waters at Lisdoonvarna Spa may be drunk, the "Spectacle" Bridge looked through, and the ascent made of the tower on the cliffs of Moher. Proceeding to Dunbeg, by way of Ennistimon and Milltown Malbay, Kilkee, a fine seaside resort, is to the right, and to the left Kilrush, where a boat may be taken across the Shannon to Tarbert.

It will not take long now to reach the best known of Ireland's beauty spots—Killarney—by easy stages, *vid* Listowel and Tralee; but as the roads are hilly and the country is wild, it may be preferred to engage other wheels for the transport. The lakes of Killarney are so well known that I need not attempt to describe their manifold beauties here: let the cyclist stay in the district as long as he possibly can. A grand ride follows, at first up a zigzag road, through two short tunnels, a long rise, a longer tunnel, and down another zigzag to Glengariff, amidst the most lovely scenery. Bantry is eleven miles away, and the road for Cork, which leads past the site of the disastrous bog slide, starts just before the latter place. From Cork you must take a peep at the "Blarney Stone," and a run to Queenstown, in the "largest and most commodious" harbour in the world. Youghal, Cappoquin, Lismore, Fermoy, on the Blackwater, all call for attention. Mitchelstown, renowned for its caves, and for certain events in recent Irish history, is not far off. Then New Tipperary, and Cashel with its miraculous rock, are on the inland road to Dublin. The better way is by Waterford, and, near the coast, Gorey, Arklow, and Wooden Bridge, to the lovely vale of Avoca (the absence of trees detracts from the scene). This is the pick of Wicklow scenery—Glenmalure, Lugnaquilla, and the far-famed Glendalough, with its seven churches, round tower, lakes, and St. Kevin's Bed. The grand tour of the Emerald Isle is now complete, for you are close to Powerscourt and Bray, before visited.

Provided the cyclist rides a good touring machine, he may rest assured that he will be equally safe and as courteously treated in Ireland as in England. And as regards climate, that of the north-west of Ireland can only be compared with the delightful one of Wessex.

TABLE OF DISTANCES.

	Miles.		Miles.
Dublin to Newry, ...	... 65	Donegal to Sligo, ...	35½
Newry to Newcastle, ...	31	Sligo to Ballina, ...	... 37
Newcastle to Belfast, ...	48	Ballina to Westport, ...	31
Belfast to Carnlough, ...	40½	Westport to Clifden, ...	39
Carnlough to Giant's Causeway, ...	40½	Clifden to Galway, ...	49
Giant's Causeway to Londonderry, ...	39	Ballyvaghan to Kilrush,	41
Londonderry to Donegal, ...	44	Tarbert to Killarney, ...	43
Londonderry to Dunfanaghy, ...	42½	Killarney to Glengariff, ...	40
Dunfanaghy to Glenties, ...	26	Glengariff to Cork, ...	60
Glenties to Donegal, ...	30	Cork to Cashel, ...	60
Donegal to Ballyshannon,	14	Cork to Waterford, ...	67
		Cashel to Dublin, ...	94
		Waterford to Dublin, ...	106

Next month Mr. Spurrier will contribute articles on **Cycling in the HIGHLANDS AND LOWLANDS OF SCOTLAND.**

THE EVENING SCHOOL CODE.

THE changes that we are called upon to notice in the 1899 issue of the Evening Continuation School Code are few, and not of great importance.

The still-vexed subject of registration is left in the unsatisfactory *status quo ante*; so that during the sessions of 1899 and 1900, precious time that should be spent in teaching, will be wasted on registration, the complexity of which is most deplorable.

Turning to the Code, we find that *Commercial Correspondence and Office Routine* are now included under the head of commercial subjects for which grants may be paid. The addition is a wise one, as much useful instruction in commercial routine may easily and pleasantly be given in Continuation Schools.

It is now specifically laid down in Article 13 (*b*) (i) that the variable grant can only be earned by a student who takes *not less than two* of the subjects upon which a variable grant is payable.

Under the concise and detailed schemes the necessary details as to the requirements in the new commercial subjects are given; and in addition, typewriting receives recommendation under both *Writing and Composition* and *Shorthand*. *Manual Instruction in Wood* has an addition to its detailed scheme, which reads as follows: "The pupils may also make dimensioned freehand sketches (plans, elevations, etc.) of the objects they are about to make, from good models, before proceeding to make their own finished working drawing. Drawing board....." and the students must also be instructed as to the purposes for which the various kinds of woods are adapted.

In Appendix I. there is to be found a notable addition, according to which expenditure hitherto restricted to ordinary repairs may for the future be legally exercised in respect to *minor improvements*, which, presumably, will increase the efficiency of the school buildings from the standpoint of the Evening Continuation School. This will be satisfactory to the friends of the evening school whose great desideratum—namely, *compulsory attendance*—cannot be conceded by a Codal change. It is to be hoped, however, that Parliament will ere long apply itself to the granting of this necessary reform, otherwise the most perfect code will produce but little effect.

SUMMER HOLIDAY COURSE FOR MANUAL TRAINING IN SCOTLAND.

THE Educational Handwork or Sloyd Association of Scotland propose holding a summer course for teachers at St. Andrews from July 24 to August 12.

The course is to include instruction in the following subjects:—

Woodwork, conducted by Mr. G. Duncan, Glasgow.

Cardboard Work, by Mr. D. Graham, Edinburgh.

Clay Modelling, by Mr. G. Haycock, author of Newmann's *Clay Modelling*.

Brush Drawing, by Miss H. Forbes, author of Nelson's *Brush Drawing for Infants*.

Kindergarten, by Miss A. Anderton, late lecturer on Kindergarten in Stockwell Training College.

There is little doubt that the *course* at St. Andrews (no pun here) will prove a most attractive one to teachers. St. Andrews is an ideal centre for a holiday combining work with pleasure, inasmuch as it possesses great historic interest, and abundant opportunities for recreation for the cyclist and the golfer. Every pilgrim to the shrine of St. Regulus will be sure to return to his home singing, with "Andrew with the brindled hair,"—

> "St. Andrews by the Northern Sea,
> Thou art a haunted town to me."

All information with regard to terms, lodgings, etc., may be had on application to Mr. Geo. Duncan, Secretary of the Association, 17 Dryburgh Gardens, Glasgow.

Schools and Scholars in 1899: Facts and Figures for the Reformer. By T. J. Macnamara, LL.D. (Supplement to *The Schoolmaster*, April 29, 1899.) Dr. Macnamara assuredly deserves well of all who profess to call themselves believers in the saving grace of national education. His special supplement to *The Schoolmaster* of April 29 is a veritable arsenal wherein the educational speaker and writer will find ready at hand a goodly store of bombshells to explode before an apathetic public. In other words, the facts and figures presented in this *brochure* are compiled with a special view to the institution of those "odorous" comparisons, which, however humiliating to our national pride, are nevertheless necessary to induce that sense of unworthiness which is a condition precedent to reformation. A glance through the little book almost reduces one to a condition of despair. No wonder Sir John Gorst is cynical. A million children, and practically the same children, absent every time the schools meet; only 35 per cent. of the scholars over ten years of age; more than 103,000 child slaves in the factories—these are some of the crying evils of the educational makeshift which we call our system. While these and many other evils which Dr. Macnamara sets forth call pitifully for redress, it is surely the rankest folly to beat the drum imperialistic and point with swelling pride to an empire on which the sun never sets. The sun has not yet risen on the education of the English working-classes. Perhaps, thanks to the untiring zeal of men like Dr. Macnamara, it will some day, and then we shall all, peers and peasants alike, come to believe that "there is no darkness but ignorance." But the time is not yet, and there is much fighting to be done. A handier weapon than Dr. Macnamara supplies cannot be procured. He has done a patriotic work, and he will have the gratitude of all earnest and thoughtful men.

THE EDUCATIONAL WORLD

A REVIEW OF EDUCATIONAL TOPICS AT HOME AND ABROAD.

EDUCATION IN ENGLAND.

N.U.T. NOTES, ETC.

BY T. B. ELLERY, F.R.G.S.,

President of the National Union of Teachers, 1895–96.

The New Executive at Work. THE new Executive of the N.U.T. began its work on May 6, the greater part of the day being devoted to routine business, adoption of standing orders, and the election of chairmen and vice-chairmen of the various standing committees. All the new members—Miss Broome, and Messrs. Moorby, Hughes, E. R. Phillips, Thompson, and Willmott—were present, and received a cordial welcome from the president. As the list will probably be of interest to my readers, I give the names of the successful candidates for the vacant posts (chairman and vice-chairman respectively):—

Education Committee—Messrs. R. Wild, B.A., and Allen Croft.

Finance—Messrs. Peaker and T. F. Bowers, B.A.

Law—Mr. S. Hicks and Dr. G. Beach, M.A.

Organisation—Messrs. A. R. Pickles, B.A., and A. S. Caudle.

Parliamentary—Messrs. J. F. Blacker and T. John.

Technical—Messrs. G. Sharples and E. L. Oliver.

Tenure—Messrs. T. H. Jones and C. W. Hole.

Superannuation—Messrs. T. B. Ellery and H. Coward.

Rural—Messrs. R. R. C. Gregory and E. C. Blackburn.

There are two special committees:—

1. *Voluntary Schools*—Messrs. G. J. Rankilor and T. Butland.

2. *Ladies'*—Miss I. Cleghorn, L.L.A., and Miss E. F. L. Goodwin.

All the machinery is therefore now in motion, and if one may judge from the enthusiasm and real interest in the work of the members, much will be done in the coming year. The president has already given earnest of his ability in the chair, his first experience being eminently satisfactory to all concerned.

The Work of the Superannuation Committee. It is but natural that I should refer to the possible programme of this committee. Our members are evidently determined that criticism shall be well to the fore in the coming year. They may rest assured that we are fully conscious of the defects in the Act of 1898, and that no efforts on our part will be wanting to remove them. Those of us who have studied the Government tables recognise that the "loading" is excessive—at least that is our conviction. We may be wrong; if so, time will tell. In any case, we are satisfied that the benefits will be greater than the present figures indicate. The age question, too, must receive attention; and I contend that "existing" teachers should receive at least as much in the way of superannuation as "future" teachers. The mere fact that they have borne the burden and heat of the day, working under conditions which will be almost unknown in the years to come, should count for something.

Time's Changes. It is a somewhat remarkable fact that of the newly-appointed chairmen and vice-chairmen of the executive committees, only four can claim eight or ten years' service at the central board—namely, Mr. Robert Wild, Mr. G. J. Rankilor, Mr. T. John, and myself. Nearly all my old colleagues are gone—three to their long home. There can be but about half a dozen members of the present Executive who attended meetings in Fleet Street. As a matter of fact, of those who were elected with myself at the Portsmouth Conference in 1887, only the following are still serving at Russell Square—Messrs. Bowden, Graves, Hamilton, John, Rankilor, and Wild.

What is the reason? In some cases, of course, it is advancing age, and in others death, but in many cases, I am convinced, it is the heavy strain which the anxious and laborious executive and committee work entails. Some of my readers may not be able to appreciate this, and others may be inclined to scoff, but the fact remains that there *is* a heavy strain, which has unmistakably told its tale in several instances.

Let those who are at times inclined to be critical remember this. We shall none of us be the worse for a little consideration.

"The Cry of the Children." On and after May 31 we shall know the fate of Mr. Robson's Bill, which proposes to raise the age for school attendance from eleven to twelve years. This Bill passed its second reading by a majority of more than five to one, drawn from all parties in the House of Commons. As *The Daily News* puts it, many ugly rumours were about as to the intentions of the Government, one of which was that not only would no facilities be offered for the committee stage, but that the Cabinet would oppose further progress. Whatever foundation there may have been for these rumours, it is clear the Conservative Ministry could not afford lightly to pass by the memorial signed by 310 members of the House, the memorialists including "a large number of agricultural members who were originally a little unfriendly towards the Bill, on the ground that, while raising the age of half-time factory labour, it also raised the age for full exemption from school in the rural districts." It is believed that a compromise has been arrived at with respect to those members—namely, that there should be an extension of the period of the harvest holidays to the children in the higher standards. The threatened Lancashire opposition will probably be of a less serious nature than was at first anticipated. The "opposition spokesman," Mr. George Whiteley, is not a Lancashire member, inasmuch as he hails from Cheshire, and there, *The Daily News* informs us, there are not 4,000 half-timers. The June number of THE PRACTICAL TEACHER will be in the hands of subscribers some days before May 31. It is the bounden duty of every man and woman interested in the welfare of England's "child slaves" to bring all legitimate pressure to bear upon members of Parliament in order to secure a full attendance in the House on the last day of the month. There ought to be a glorious victory in spite of Mr. Whiteley of Cheshire.

The Metric System. On several occasions I have moved at Conference a resolution in favour of the Metric System. The resolution has always been carried, so it may be concluded that the teachers of England and Wales are on the side of reform in the matter of the existing coins and weights and measures. It is not sufficient, however, to carry pious resolutions at Conference. We must endeavour to influence public opinion, public bodies, etc., and this is not such a difficult matter as some may imagine. On May 9 it was my privilege to bring before the Luton Town Council a resolution in favour of a decimal system of money, weights, and measures. The debate was an extremely interesting one, and the result eminently satisfactory; for of the twenty members present only three did not vote, and the remaining seventeen voted for the resolution. May I suggest to

my friends who are on town councils that they might well move in a similar direction, and thus strengthen the hands of the Decimal Association? Next to superannuation perhaps, this is the reform which is nearest and dearest to my heart. If the N.U.T. set to work in real earnest, a "Metric" Bill would be passed within a few years. Who will help?

Our Tenure Cases. In spite of the publicity which is given to cases of injustice to teachers in the matter of "reasonable security of tenure," the evil goes on. No sooner do we emerge from one conflict than we have to enter upon another campaign. The other day it was Linthwaite; now it is Highworth, in Wiltshire. There the victim is Mr. J. S. Jenkins, formerly a member of the Executive. Wisely or unwisely, Mr. Jenkins took action in support of the return of a certain party to the School Board. That party was defeated. The majority soon began to "make things hum." The first step, or one of the first, was to reduce the head-teacher's salary by £110 a year. This did not drive Mr. Jenkins from his post. Other "difficulties" then arose, and the Board decided to dismiss him.

MR. T. CLANCY, M.A., PRESIDENT, N.U.T.
(From a recent photograph.)

Quite recently the Parish Council election was held, and the dismissed schoolmaster was placed at the top of the poll, with double the number of votes polled by one of the majority members of the School Board who voted for his dismissal. From an inquiry we have made upon the spot, we know that the parents and ratepayers generally are incensed against the three members who have turned adrift an exceptionally successful teacher. This is a very serious case. Mr. Jenkins is approaching the superannuation age. Should he be unable to obtain another appointment—and with the "none over forty need apply" staring him in the face, his lot is by no means a happy one—he is professionally ruined, and, at the same time, practically shut out from participation in the benefits conferred by the Superannuation Act of 1898. Our course is perfectly clear: we must stand by Mr. Jenkins, and teach the Highworth School Board a practical lesson. There will be lively doings in this Wiltshire village—or is it town?—ere long.

Mr. Peaker and Mr. Inspector Tate. It will be remembered by those who attended the Cambridge Conference that Mr. Peaker formulated a grave indictment against Mr. Inspector Tate, of the Leeds School Board, in the matter of reports upon infants' schools. Roars of laughter followed his reading of various reports upon the work of the babies. Mental arithmetic wasn't strong, the recitation was open to objection, and so on. Mr. Tate took the earliest opportunity he had to deny the "soft impeachment."

Indeed, a slander action was freely talked of, in which Mr. Peaker would appear as the defendant. But the astute chairman of the Union's Finance Committee withdrew nothing, and offered no apology. On the contrary, he returned to the attack in a long letter which appeared in the columns of the organ of the Union.

It is an interesting case, and some of us are curious to know what the end will be. Mr. Tate can hardly allow the matter to rest where it is.

Sir John Gorst's Position. After all the good work Sir John Gorst has done for education and for the teaching profession, one hesitates to say an unkind word respecting him. But after the right hon. gentleman's recent performances in the House, when he was clearly in revolt against *some* at least of his reactionary colleagues, yet vowed he was all obedience to his official superiors, one would be justified in using very strong language. The mystery of it all is, how *can* Sir John continue to hold his present position under the circumstances? What is the meaning of it? After all the speeches he has delivered, in Parliament and out, on the subject of pupil teachers, rural education, etc., etc., what are we to think of his action in the House when he tamely allowed the Ministerialists to have their way on the pupil teacher question? *Punch's* cartoon should have made Sir John feel somewhat ashamed.

Recurring Decimals. As an examiner to a certain institution, it is my pleasure and privilege to see some remarkably good work from time to time. I need not say that occasionally I see something of a different character. One of my questions in a recent examination was, "How many kinds of recurring decimals are there?" To which an ingenious maiden replied, "There are two kinds of recurring decimals—those that do recur and those that do not." This young lady doesn't mean to be dismayed by trifles!

The Curious Deadlock at Linthwaite. The Union won a great victory at the Linthwaite School Board election, securing four seats (first, third, fifth, and sixth) out of seven. Unfortunately for the sake of Mr. Reynolds, the top man, Mr. Whittell, was ineligible under the Bankruptcy Act, as he had not applied for his discharge at the proper time. There is therefore a deadlock at Linthwaite, the three members in favour of the reinstatement of Mr. Reynolds declining to give way. No agreement can be come to as to a chairman, and chaos reigns supreme. If something is not done, and done quickly too, the Education Department will declare the Board in default.

Appointment of Assistant-Secretary to the Funds. The Finance Committee of the Orphan and Benevolent Funds (N.U.T.) met on May 10 to examine the applications received for this post.

When these were placed upon the table, they were found to number about ninety. After a long and careful examination these were finally reduced to seven, and it was then agreed to send the names of the seven selected candidates to the Council, which met on Saturday morning, May 13, to make the appointment.

Mr. James Hodge, the chairman, had prepared a full statement as to the qualifications of the respective candidates. This was read out, and each of the gentlemen called up was invited into the room to answer a series of questions which had been drawn up, and to make any additional statement which he might feel the Council ought to have.

This preliminary step over, the Council proceeded to the vote, which was conducted upon the exhaustive principle.

In the end Mr. Bickerton of Nottingham was elected.

We congratulate Mr. Bickerton upon his election, and the Council upon the fact that it has secured the services of a highly-qualified gentleman for this important post.

We trust that all friends of the Funds will now set to work to raise a "record" amount for the York Conference.

EDUCATIONAL NOTES.

BY CATHERINE I. DODD,

Owens Day Training College, Manchester.

"The Paidologist"—Imitativeness of School Children—Reports of the Training Colleges—The Summer Holiday Course in Jena—Professor Earl Barnes on Children's Property Sense.

What Child Study has done for Education. THE British Child Study Association have issued the first number of their organ, *The Paidologist*. The editor, in remarking that the title of the magazine seems to call for some apology, says: "It is intended to be unattractive to children, and to those who, from lack of special interest in the topics treated of, would be 'bored' by what that title represents."

Dr. Stanley Hall, President of Clark University, Massachusetts, contributes the opening article. He says that child study in America "is now slowly emerging from the tentative stages, which were marked by criticism, misrepresentation, and honest misconception, and is coming to be recognised as, at the very least, a new psychological method."

"Child study," he says, "is primarily for the benefit of the children, secondarily for that of the teacher, and incidentally for the benefit of science."

In summing up what child study has done for education apart from the scientific value of the movement, Dr. Hall points out that it has brought together the higher and lower grades of education, and that the university professor and kindergarten teacher co-operate in studying child life; that it has brought the teachers into rapport with individual pupils, and made them less content to regard the class as a unit; that it has helped toward the discovery of nascent periods when individual subjects can be most effectively taught; and, finally, that it has lessened the number of misunderstood children.

Mr. Holman on Imitativeness. Mr. Holman, in his interesting article on "Imitativeness in School Children," says that "far too much work done by the pupils in our schools is considered merely from the point of view of its accuracy. Such work, however carefully and methodically done, is but cram of an inferior or superior kind: for the pupil is simply regarded as a receptacle in which information has to be stored, and from which it must be produced on demand." He worked out an interesting experiment with a number of children. An anecdote was read aloud to them, no remarks were made concerning it, and they were asked to reproduce it in writing. In carefully analysing the papers, Mr. Holman gives us interesting diagrams showing the children's accurate imitativeness and inaccurate inventiveness.

Among the conclusions and questions which the children's papers suggest are some valuable pedagogical reflections:—

1. What is already in the mind largely determines the meaning and value of that which is afterwards to enter it.

2. Words by themselves convey no new ideas; they can only suggest them by so acting upon the mind as to cause the new ideas to be inferred from the old.

4. The mind is naturally aggressive. This must always be allowed for, even when we do not wish to cultivate this side of it.

6. Are we not sacrificing the higher powers of inventiveness to the lower ones of imitativeness in requiring the present form of work in composition from children in the Fifth Standard?

7. Is not too much of our general school work on the lines of imitativeness instead of inventiveness?

Training College Reports. The reports of the training colleges for the year 1898 are just issued.

Sir Henry Oakeley again urges that the college "time-tables should show little or no work between dinner and tea, and that there should be fewer lectures and more time for independent study and self-help." In the colleges where this is adopted good results follow.

He complains that the supply of training colleges is deplorably deficient, even with the addition of the day training colleges, which in 1897–98 contained 462 men and 488 women.

It appears, by the results of the Queen's Scholarship Examination held in December 1897, that 1,045 men desired to enter training colleges, and there were only approximately vacant places for 980; and of the women who passed, 1,194 were unable to find places.

Mr. Scott Coward speaks of the importance of providing recreation rooms, workshops, and special rooms for criticism lessons in the training colleges.

He says that in the majority of the colleges no definite instruction is given to the students in manual work, and they leave with "no knowledge of any kind of a branch of instruction which is daily forcing itself into notice on utilitarian grounds, and which should take prominent rank in the curriculum of every type of school."

In attacking the practising schools attached to some of the residential colleges, Mr. Scott Coward says that they "are far from being model institutions. On the contrary, many—I had almost said all—of them in some one respect or other are models of what a school should not be. They are frequently miserably furnished with old-fashioned, rickety desks; they are often ill-equipped with proper apparatus; are not seldom gloomy and dingy; and in many of them the methods of instruction are not such as can benefit the students."

Mr. Barnett on Text-books. Mr. Barnett complains that school management text-books are often followed in the colleges with slavish exactness. "One is often astonished by the little note which is taken in some training colleges of real discoveries made and established in the science and practice of education.....For instance, the five so-called stages or steps in teaching which the followers of Herbart have elaborated would often give help and suggestion to a struggling young teacher who is left otherwise to toil along painfully without any definite or concentrated object of endeavour." Concerning notes of lessons, Mr. Barnett says they "contain a mass of items without any real interconnection, and three times as much as could possibly be taught within the time assigned."

Pedagogical Holidays at Jena. The syllabus for the Summer Holiday Course in Jena is now ready.

The pedagogical section is particularly interesting and varied. It contains the following courses of lectures:—

1. General Method. Prof. Dr. Rein.
2. Special Method, with model lessons in Scripture, History, Geography, and Geometry. Oberlehrer Fr. Lehmensick.
3. School Hygiene. Prof. Dr. Gärtner.
4. Difficult and Abnormal Children and their Education. Direktor J. Trüper.
5. Child Psychology from an Educational Point of View. Rektor Ufer.
6. The Pedagogy of Froebel in the Kindergarten and School. Johanna Mecke.
7. School Life and School Instruction. Direktor Scholz.
8. Theory of Handwork. Dr. O. W. Beyer.

The Language Classes. The language classes are especially interesting to foreigners.

The elementary class for beginners in German will be conducted by Oberlehrer Lehmensick. The conversational method is adopted. This class meets daily for three weeks.

The conversation and literature class, for those pupils who have already had some practice in speaking German, will be conducted by Dr. Julius Goldstein. The subjects under discussion in this class are the history of the Jena University, Goethe and Schiller, and their connection with Jena.

There are also courses of lectures in geology, botany, psychology, literature, and natural science. The course continues from the second of August to the twenty-second.

All information may be obtained from the secretary, Hugo Weinmam, Jena, Spitzweidenweg.

What to do with a Shilling. Professor Earl Barnes, in *Child Life*, records his attempts at studying children's property sense with a class of students at the College of Preceptors. The following test was proposed to three hundred and fifty London Board School children:—"Tommy Parker was going fishing for sticklebacks with two other boys, when he found a shilling in a ditch on the way. If you had been in Tommy's place, what would you have done with it?" The test is so arranged as to place the child who answers it in the presence of four distinct obligations:—

First, the duty to the original owner.

Second, the duty to his parents, who support him, and are entitled to any money that may come into his possession.

Third, the duty to the two other boys who were with Tommy.

Fourth, the duty to himself to be honest, generous, to use good judgment, and have a good time.

In his final summing up, Mr. Barnes shows that 68 per cent. of the children consider themselves, 33 per cent. consider the other boys, 37 per cent. consider their parents, and 36 per cent. consider the original owner.

The younger children rarely compromise. It is only with advancing years they try to bring all the conflicting obligations into line, and give each its due weight in reaching a decision.

NOTES FROM THE NORTH.

Dover House active. During the past month it has simply rained papers from Dover House. Circular, Minute, and Code have followed one another in rapid succession, and, in one instance at least, we have had a continuation of the policy referred to in Lord Balfour of Burleigh's Paisley speech—namely, that of the administration of Scottish education, but especially Scottish secondary education, by Circulars and Minutes issued by the Scotch Education Department, instead of by legislation in Parliament.

Circular 225 relates to the election of the Committees on Secondary Education in Scotland. These elections are to take place as soon as may be after May 1, 1899. The Circular introduces no changes from preceding years.

With regard to the distribution of the sum available for secondary or technical (including agricultural) education, amounting to £35,000, a Minute was issued on April 27. Towards defraying the cost of the inspection of higher-class schools, and of the holding of examinations for and granting the Leaving Certificates, a sum of £2,000 is allocated. It is not clear with reference to this grant whether it is in addition to the £2,000 already voted for this purpose from the equivalent grant, or to relieve that fund.

For agricultural education £2,000 has been set aside, while the remainder is to be devoted to the aid of such higher-class secondary or technical schools as are not in receipt of grants under the Scotch Code. The distribution of the last sum is to be made through the County Committee on Secondary Education, who are to transmit a return to the Department, in whose hands is placed the allocation of the grant. This method supersedes the existing authority, while, at the same time, it makes provision that each secondary school will be treated as a unit for the distribution of the money. There is likely to be no little discussion over this in view of the multiplication of authorities who have the distribution of money in connection with secondary education in Scotland.

Superannuation. Each certificated teacher has during the last few weeks received a form of acceptance, an accompanying Circular (251), and a table showing the amount of annuity, payable quarterly, from the attainment of the age of 65.

In connection with these, the following points, on which some doubts seem to exist, may be referred to:—

1. A teacher is entitled to an annuity proportionate to the number of payments made, however few these may be. For example, if a lady at the age of 21 pays in one premium of £2, she is entitled to receive at the age of 65 an annuity of 15s. 4d.

2. The method of calculating the Government pension is as follows:—If a teacher is at the passing of the Act 34 years of age, and has been in service for 13 years, he is entitled to 13 × 3 = 39d. = 3s. 3d. + 10s. of state pension = 13s. 3d. for each year of service from 21 to 65 = 13s. 3d. × 44 = £29, 3s.; *not* 13s. 3d. × 13, the number of years served prior to the Act, and 10s. × 31, the number of years served after the passing of the Act. We note this in view of certain queries we have received on the point.

3. The reading of the annuity tables has caused much trouble. They are read in this way. Take the case of a teacher who is 36 years of age at the passing of the Act: then, as his annuity on £3 annual premium, he is entitled to the sum of the column of figures from £1, 0s. 3d. to the foot of the table, or £17, 16s. 9d.; and if he is engaged continuously in teaching from the age of 21 to 65, he receives a Government pension of £30, 5s.—in all £48, 1s. 9d.

Take the case of a lady teacher at the same age: she is entitled to the sum of all the figures added downwards from 10s. to 3s. 7d., or £9, 9s. 8d., which being added to the Government pension, makes her pension equal to £37, 4s. 8d.

We append a few more examples, taking the case of teachers who began service at 21 years of age:—

Age at Passing of Act.	Annuity Purchased by Teachers' Contributions.				Government Pension at Age 65.				Total Pension Receivable at Age 65.			
	Males.		Females.		Males.		Females.		Males.		Females.	
	£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.	
31	23 8 10		12 4 3		27 10 0		25 13 4		50 18 10		37 17 7	
32	22 4 11		11 12 8		28 1 0		26 0 8		50 5 11		37 13 4	
33	21 1 9		11 1 5		28 12 0		26 8 0		49 13 9		37 9 5	
34	19 19 4		10 10 6		29 3 0		26 15 4		49 2 4		37 5 10	
35	18 17 8		9 19 11		29 14 0		27 2 8		48 11 8		37 2 7	
36	17 16 9		9 9 8		30 5 0		27 10 0		48 1 9		36 19 8	
37	16 16 6		8 19 8		30 16 0		27 17 4		47 12 6		36 17 0	
38	15 17 0		8 10 0		31 7 0		28 4 8		47 4 0		36 14 8	
39	14 18 2		8 0 7		31 18 0		28 12 0		46 16 2		36 12 7	
40	14 0 0		7 11 6		32 9 0		28 19 4		46 9 0		36 10 10	
41	13 2 6		7 2 8		33 0 0		29 6 8		46 2 6		36 9 4	
42	12 5 7		6 14 1		33 11 0		29 14 0		45 16 7		36 8 1	
43	11 9 4		6 5 9		34 2 0		30 1 4		45 11 4		36 7 1	
44	10 13 8		5 17 9		34 13 0		30 8 8		45 6 8		36 6 5	
45	9 18 7		5 10 0		35 4 0		30 16 0		45 2 7		36 6 0	
46	9 4 1		5 2 5		35 15 0		31 3 4		44 19 1		36 5 9	
47	8 10 2		4 15 1		36 6 0		31 10 8		44 16 2		36 5 9	
48	7 16 9		4 8 0		36 17 0		31 18 0		44 13 9		36 6 0	
49	7 3 11		4 1 2		37 8 0		32 5 4		44 11 11		36 6 6	
50	6 11 7		3 14 7		37 19 0		32 12 8		44 10 7		36 7 3	
51	5 19 9		3 8 2		38 10 0		33 0 0		44 9 9		36 8 2	
52	5 8 5		3 2 0		39 1 0		33 7 4		44 9 5		36 9 4	
53	4 17 7		2 16 0		39 12 0		33 14 8		44 9 7		36 10 8	
54	4 7 2		2 10 3		40 3 0		34 2 0		44 10 2		36 12 3	
55	3 17 3		2 4 8		40 14 0		34 9 4		44 11 3		36 14 0	
56	3 7 9		1 19 4		41 5 0		34 16 8		44 12 9		36 16 0	
57	2 18 8		1 14 2		41 16 0		35 4 0		44 14 8		36 18 2	
58	2 10 0		1 9 3		42 7 0		35 11 4		44 17 0		37 0 7	
59	2 1 9		1 4 6		42 18 0		35 18 8		44 19 9		37 3 2	
60	1 13 11		0 19 11		43 9 0		36 6 0		45 2 11		37 5 11	
61	1 6 5		0 15 7		44 0 0		36 13 4		45 6 5		37 8 11	
62	0 19 3		0 11 5		44 11 0		37 0 8		45 10 3		37 12 1	
63	0 12 6		0 7 5		45 2 0		37 8 0		45 14 6		37 15 5	
64	0 6 1		0 3 7		45 13 0		37 15 4		45 19 1		37 18 11	

In the Circular issued to school managers (257), we find that the first contribution will be payable from April 1, 1899, irrespective of the date when a teacher accepts the Act.

A notice has also been sent to second-year candidates (Circular 252) with reference to the evidence of age and to the medical examination, which must take place this year not later than July 31.

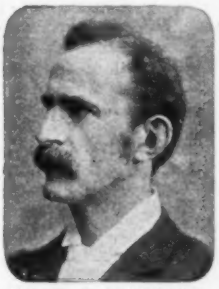
Evening School Code. The Evening School Code now issued contains no changes except those which are necessary on account of the great alterations in the Day School Code, Article 19, and the fact that manual training is now dissociated from drawing in connection with the reduction of grant, Article 32.

The Presidentship of the Institute. The "blue ribbon" of the teaching profession of Scotland is not to be gained this year without a contest. For the last two years the candidate has been unopposed, but this year no fewer than four have been nominated by different branches. Though this is the case, there are only two in the running, as the candidature of Mr. A. Mackenzie, Maryburgh, and of Mr. A. Menzies, Kirriemuir, is not being pressed this year; but it would seem as if their names had been brought forward with a view to 1900 election.

Mr. W. S. Blackstock, Kirkcaldy, and Mr. James Paterson, Edinburgh, will both go to the poll, and from all accounts the election is likely to be an interesting one.

Mr. W. S. Blackstock, head-master, Dunnikier Public School, Kirkcaldy, was, it will be remembered, a candidate for the presidentship last year, but retired in favour of the present president of the Institute, Mr. J. G. Thomson. A native of the Stewartry, he was born towards the middle of the century. He was educated for some time in the town

of Kirkcudbright, and finished his school days in Edinburgh under Mr. Crowe, a former president of the Institute. He went through the usual course of training, having been a pupil teacher in Kirkcudbright, and a student of the Established Church Training College, Edinburgh.



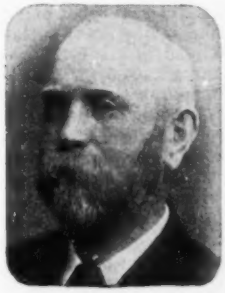
MR. W. S. BLACKSTOCK.

On finishing his course there, he was appointed to the important church school of Pitlochry. Thence he migrated southwards to the Parish School of Kinross, where he succeeded Mr. Robert Burns Begg, a nephew of Scotland's poet. Twenty years ago he was appointed to the Burgh Public School, Kirkcaldy, in which town he has since taught with conspicuous success.

Mr. Blackstock has served as a member of the General Committee of Management of the Institute for close on twenty years. He is a member of the Special or Executive, of the Finance —in short, of nearly all the committees of the Institute, in which he has borne his full share of work. Elected to the vice-presidentship for the eastern province in 1895, he did much valuable work in that corner by stirring up enthusiasm on behalf of the Institute. He is, however, best known in connection with his work as Chairman of the Superannuation Committee, in which capacity he has, in season and out of season, worked "like a Trojan." Truly an indefatigable, he has addressed meetings in nearly every branch of the Institute, and has proved himself no unworthy successor of Mr. J. G. Kerr, the late convener.

Mr. Blackstock, it may be mentioned, is a distinguished botanist. He has taken for many years a deep interest in natural history, and has contributed much to the success of the East of Scotland Naturalists' Union. He is a Fellow of the Botanical Society. Alpine botany has always had great attractions for him.

Mr. James Paterson, head-master, South Bridge School, Edinburgh, the other candidate for the presidency, is a native of Ayrshire. He was born towards the middle of the forties. After serving as a pupil teacher in Milton School, Glasgow, under Mr. J. Robertson, now head-master of Woodside Public School, Glasgow, he entered the Established Church Training College there. His first appointment was as second master in Gorbals Youths' School, Glasgow. After two years he was chosen for the head-mastership of the handsome new school built by the Carron Company at the Carron Iron Works, Stirling. He was during that period actively identified with the Stirlingshire branch of the Institute, of which he was president in 1877.



MR. JAMES PATERSON.

On leaving Carron in 1880, he was appointed to North Canongate Public School under the Edinburgh School Board; and when South Bridge School was opened in 1886, he was transferred to it. This school he has conducted since then with marked ability.

Mr. Paterson was elected by the Stirlingshire Branch as a member of the General Committee of Management in 1879, and, with the exception of a few years at the time of his transfer, has been a member ever since. In 1889 he was elected to the Special and Finance Committees, on which he has been more or less continuously to the present time.

He was appointed vice-president of the Institute for the South-East Province in 1895. He is a member of the Superannuation and Organisation Committees this year. No doubt largely on account of the interest taken in the formation of the Benevolent Fund by the Edinburgh Branch, he was chosen as the first chairman of that committee; while as convener of the Business Committee for the revisal of the duties of the officials and of the rules for the election of president, etc., he showed his eminent business qualities.

As a member of the Edinburgh Branch, he acted as treasurer for a number of years, and was unanimously chosen for the presidentship of the branch.

Mr. Paterson, while he has not given himself to public speaking (though during the last year it is not for want of being asked, as we understand numerous associations throughout the country have been desirous of hearing him), is, as most of our readers are aware, editor of the Educational Institute of Scotland column in this journal.

Whether the members of the Educational Institute of Scotland will search for their new president across the silver hills of speech or, as last year, through the golden vales of silence, is a matter on which we do not wish to prophesy, but certain it is the searching will be a somewhat protracted one, as the voting begins on the twentieth of May and is not finished until the fifteenth of August—nearly three months. There is little danger, therefore, of members voting in haste; and in view of the undoubted ability and high reputation of both candidates, there is as little danger of their repenting at leisure.

Scotch Code Queries.—Those of our readers who find any difficulty in the interpretation of the new Scotch Code are invited to write to the EDITOR, 33 PATERNOSTER ROW, LONDON, E.C. Queries should be marked "*Scotch Code*," and should be accompanied by the coupon on the last page of the current number of THE PRACTICAL TEACHER.

TECHNICAL AND SECONDARY EDUCATION.

THE progress of the Board of Education Bill has formed the chief centre of interest during the past two months. On the twenty-fourth of April it was read a second time in the House of Lords; on the second of May it passed through the committee stage, practically without amendment. Questions were raised respecting religious education, inspection, the powers of the Charity Commissioners which are to be transferred, and cognate subjects. Some criticism also was forthcoming as to the inadequacy of the measure, inasmuch as no power was taken to establish or control local authorities for secondary education; but the Duke of Devonshire disarmed criticism by intimating the possibility of introducing a Bill for that purpose next year.

What the Bill does.—The Bill effects a change of great magnitude. It creates an authority which takes over all the powers of the Education Department, including that other semi-independent body, the Science and Art Department, and some of the powers of the Charity Commissioners respecting educational establishments and endowments under their control. It thus provides a measure of control over technical and secondary education not dissimilar to the powers at present exercised by the Education Department over primary education and schools. It gives the Board power, by means of its own officers, or by any university, to inspect any school supplying secondary education desiring to be so inspected, for the purpose of ascertaining the character of the teaching in the school, and the nature of the provision made for the teaching and health of the scholars. It gives power to County and County Borough Councils to contribute to the expenses of such inspection. It provides for the establishment of a Consultative Committee consisting, as to not less than two-thirds, of persons representing universities and bodies interested in education, for the purpose of framing regulations for the formation of a register of teachers and advising the Board on any matter referred to it by the Board; and it makes provision, now operative in primary education, for placing any proposed order on the tables of both Houses of Parliament four weeks before being presented to Her Majesty in Council.

Inspection.—The chief points about the Bill which more especially concern teachers are those relating to inspection, the nature of the Consultative Committee, and registration. Inspection is to be voluntary, and will only take place on the initiative of the proprietors or governors of

the school. It is to be paid for by the counties and county boroughs. A sort of indirect compulsion to submit to examination will be exercised, as it is hardly likely that any help from the County Council funds will be extended to those schools of which they know nothing except that they exist. A protest has already been lodged by the Association of Technical Institutions against the appropriation of any of the Customs and Excise money being granted for this purpose, as it is already all appropriated to the encouragement of education. The Association also declares that the money ought to be devoted to technical education only. Other writers are afraid that the inspectors will not be of the highest class, and that there will thus be a possibility of the aim and character of the poorer schools becoming altogether different from that of the richer schools and the universities.

The Consultative Committee. The composition of this may or may not be satisfactory to the various associations of teachers, according to the standpoint from which they look at it. Two-thirds of the members are to be drawn from the universities and bodies interested in education. In the Registration Bill of 1896 the various bodies which were to form the committee were named, and some exception was taken to the composition. Now the societies are not named, and the nomination will rest in the hands of the president of the Board, who is unfettered as to the size or the constitution except as above named. There may be—no doubt there will be—a desire to satisfy all parties, but a definite apportionment, we think, would have been better.

Registration. This Consultative Committee is to be a permanent body, but it will have no statutory powers. It will advise the Board on any matters referred to it by the Board, and it will have the duty of framing, with the approval of the Board, regulations for the formation of a register. Here is a very wide and very vague reference. The Registration Bill laid down a principle upon which the register was to be based. It specified distinctly the conditions under which persons might be placed on the register. The Consultative Committee are not, and will not be, bound by any such limitation. They have only to get the sanction of the Board, and then the regulations, probably without any submission to the Houses of Parliament, will become the rule for registration. The representation being mostly in the hands of the university and secondary school men, the interests of the trained certificated teachers of the country will probably be overlooked, for it will be much more difficult to effect a change in an order of the Board of Education than it at present is to alter a Bill before it becomes an Act of Parliament. The Executive of the National Union of Teachers should see to this point.

Professor Jebb and the Unity of Education. The paper read by Professor Jebb to the teachers at the Cambridge Conference marks a distinct advance in the opinions now prevalent respecting the relation between primary and secondary education. When the president of the Liverpool Conference (Mr. Bowden) preached "Unity and System in Education," his utterances were very largely scouted by the secondary journals; and at the Conferences at Oxford and Cambridge for the purposes of considering secondary education, the claims of School Boards and teachers in primary schools to have any share in the settlement of the questions relating to secondary education were considered as preposterous by many of the speakers. Now we have the member of Parliament for the university, formerly the public orator, and still the Professor of Greek, preaching the same doctrine. It needs only that practical teachers of all kinds shall come together, and the idea of the essential unity of education will become more general still. It is to be regretted, however, that the framers of Clause VII. of the Science and Art Directory have given us a concrete example of their desire to dissociate primary from secondary education entirely. Every attempt to bring teachers together and to broaden the views of all should be gladly welcomed, and all will agree with Sir Philip Magnus when he says: "When the methods of the two grades of education are better assimilated, the passage of children from the elementary to the secondary school will be more easily effected."

Gifts for Educational Purposes. The past month has shown several instances of remarkable generosity on behalf of education. The first announced was that of Mr. Passmore Edwards, who offered a sum of £10,000 for a building to be devoted to the teaching of economics and commercial science in the new university of London. The fund of £250,000 required for the endowment of the proposed Birmingham University has just been completed by the munificent contribution of £50,000 by Mr. Andrew Carnegie, and £37,500 by an anonymous donor, through Mr. Chamberlain, M.P. It is to be noted that this large amount has been given in order that scientific and technical education may have as much attention as the older classical education of the more ancient universities. If like sums were provided by the wealthy people of London, the new teaching university of the metropolis, with its new faculties of engineering and economics and political science, would have a better chance of success.

The London School Board and its Schools of Science. The opposition to the higher work of the London School Board has become more pronounced. The Science and Art Department has asked by what right the School Board carries on its schools of science. The Board has pointed to the assistance and concurrence in the work by the Department for a great number of years. Now several secondary schools and schools of art have protested against the Board having free classes of a higher character in their neighbourhood. They have appeared before the public auditor and made a general complaint. The inquiry has been adjourned for the purpose of specific payments being objected to, and will probably be concluded while this number is going through the press. If the Board loses the aid from the Science and Art Department, it is highly probable that the work will be continued without that aid.

London and Clause VII. The London County Council has been recognised as the authority for secondary education under Clause VII. of the Directory. It has transferred all its powers to the Technical Education Board, of which Mr. T. A. Organ, B.A., one of the standing counsel of the N.U.T., is the chairman.

Technical and Secondary Education Statistics. The official returns of the aid now being granted to technical education by the County and County Borough Councils have lately been issued, but they refer only to the year 1896–97, whereas the information obtained by the National Association for the Promotion of Technical and Secondary Education has been brought down to a period twelve months later. No less than thirty-nine local authorities are recognised under Clause VII., the latest additions being Gloucester, Hastings, Hull, Stockport, Walsall, and, as we have already said, London. There are 248 technical schools of different types under the control of, or in course of establishment by, local authorities, the aggregate expenditure incurred in the establishment of these schools being no less than £2,464,072. Of the Local Taxation (Customs and Excise) money, which amounted last year to £827,000, no less than £770,000 was devoted to technical education. Some of the previous years' accumulations (£332,000) have been earmarked for education. A sum of £57,000 was raised by rates under the Technical Instruction Acts. Thirty-eight of the forty-nine counties devote the whole of their money, and ten a part of their income, to education; while fifty-four of the sixty-one county boroughs devote the whole and the rest a part of their receipts from the whisky money to the same purpose. The estimated expenditure from all sources during 1898 was £814,000. In Wales the amount was £33,000, while Ireland had to be contented with £4,783. The whole of the figures show steady progress, but at the same time they point to the fact that fresh sources of revenue or the more general application of the Technical Instruction Acts will be needed before secondary education can receive any more help from public funds.

A STANDING ORDER

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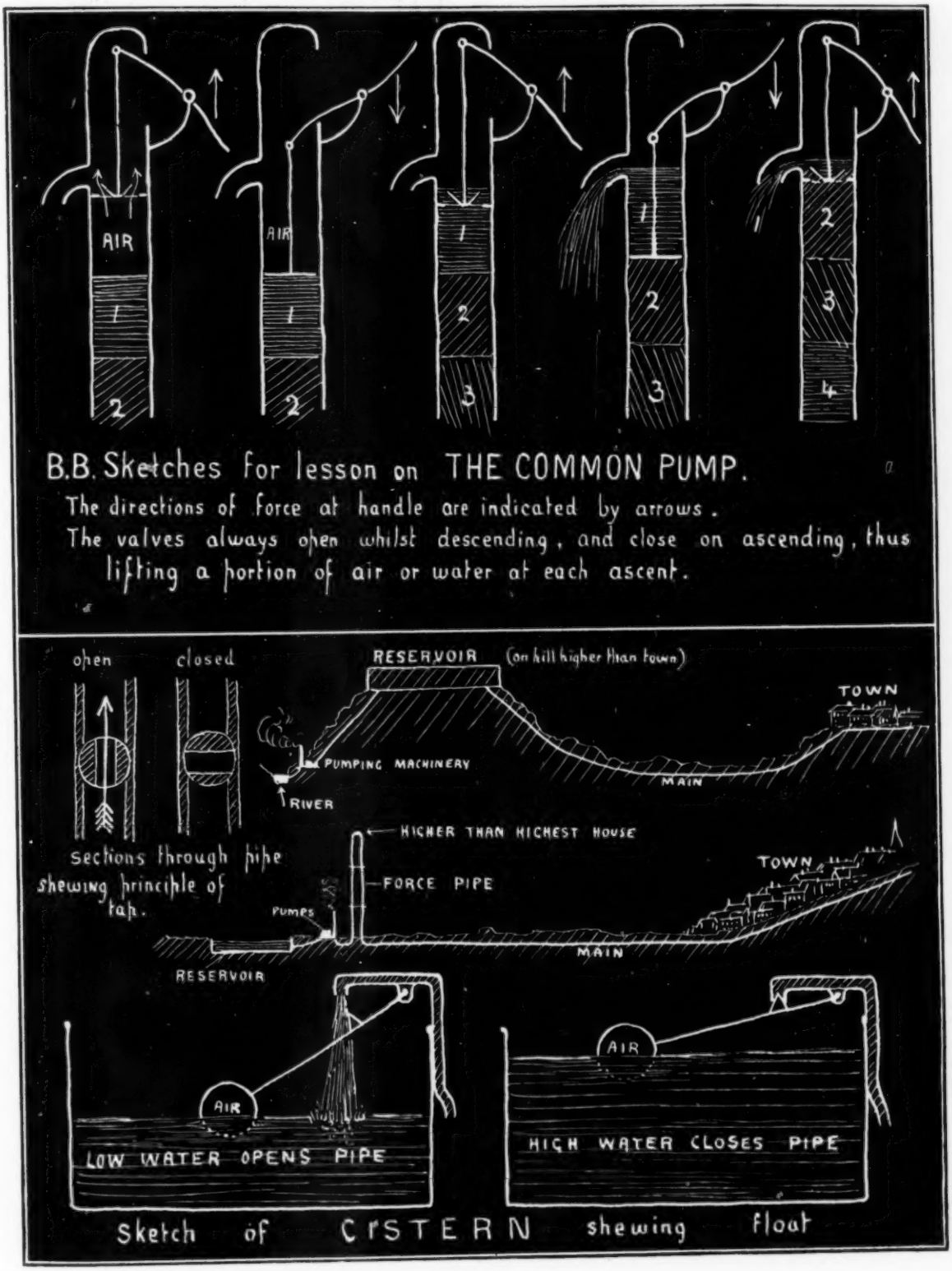
THE PRACTICAL TEACHER'S ART MONTHLY.

BLACKBOARD ILLUSTRATION.

BY C. ARMSTRONG, ART MASTER, CITY OF LONDON SCHOOL OF ART, EXAMINER TO DEPARTMENT OF SCIENCE AND ART.



OUR CLASS ROOM AIDS

NOTES OF TWO LESSONS.

By WILLIAM DONE, B.A., *Head-Master of Brighton Pupil Teachers' School.*

(Circular 369—Section VI. B (I).)

I.—THE COMMON PUMP.

EXPERIMENT OR ILLUSTRATION.	INFERENCE.
Take a long test tube, fill it with coloured water, and invert it in a pneumatic trough. The children notice that the column of water remains.	Something is pressing the water up the test tube.
Take a fairly long, narrow piece of glass tubing open at both ends. Stand it in the trough. Notice that the water is practically at the same level inside and outside the tubing.	
Suck the open end of the tubing, and note the result.	When the top of the tube is open, the water does not rise up it.
Place the thumb tightly over the open end, and lift the glass tubing from the trough. The water remains in the tube.	The air is being sucked out, and the water rises.
	There is no air in the top of the tube to press the water down; therefore, when the pressure of the air is removed from above, the water is supported by the pressure of the air at the other end of the tube.
Draw on the blackboard a diagram of a section of a common pump, showing cylinder, piston, valves, spout, handle, and pipe leading to reservoir.	
Suppose the end of the narrow pipe leading from the cylinder to dip into water. Now if the piston-rod, which fits the cylinder tightly, be lifted up, what will be the result?	The valve at the bottom of the cylinder can only open upwards; the valve or valves in the piston can only open upwards.
Suppose the piston is now pushed down, what will happen?	The air from the pipe will be sucked into the cylinder, lifting up the little valve at the bottom of the cylinder.
When all the air in the pipe has thus been sucked up, what will be the result if the piston be still raised and lowered?	The air cannot get back into the pipe, because the little valve will fall down and close it; but the imprisoned air will push up the valve in the piston and reach the part of the cylinder above the piston.
	The water will follow the air and get into the cylinder, and thence, by means of the valves in the piston, into the upper part of the cylinder, and eventually escape by the spout.
Show how the piston-rod is attached to the pump-handle.	It forms a more convenient way of raising and lowering the piston.
When we work the handle of a pump, usually the water does not come immediately. Why is this?	(The answer to this question will partly test the success of the lesson.)

II.—THE FOUNTAIN, PIPES, TAPS.

EXPERIMENT OR ILLUSTRATION.	INFERENCE.
If a water-level apparatus is not at hand, one can easily be made by arranging variously-shaped vessels in connection with each other. Pour water into one, and let the class note the result.	Though some of the vessels are wide and some are narrow, and some perhaps twisted, yet the water stands at the same height in each one.
	(Enunciate the fact in the usual words: Water finds its own level.)
Get a large tin can, attach a piece of glass tubing by making a hole near the bottom of the can. To this fasten a long piece of india-rubber tubing, and again finish off the end with another piece of glass pipe. Fill the can with water, place it on the top of a cupboard or high shelf, and observe the issuing jet.	We have constructed a fountain owing to our knowledge of the fact observed above. We inferred that the water having descended the pipe, would have to ascend by means of a jet to find its own level.
Call attention to the fact that the jet does not reach quite so far up as the water receptacle placed on the shelf.	Some of the force with which the water descends is used up in forcing its way through the narrow india-rubber pipe.
Question out the source of the water-supply to the children's homes. In the first place, it may be stored in the cistern. If so, where is the cistern placed?	The cistern is placed near the top of the house, if not under the roof itself, in order that water may be obtained on any floor. This is a further illustration of the fact that water finds its own level.
Elicit that the cistern is fed by a pipe coming from a much larger pipe under the road, called the water-main. This, traced back, comes from the storehouse of water called the reservoir, which is situated on high ground.	The reservoir situated on high ground corresponds to the large tin can on the shelf. The large water-mains and the smaller house pipes correspond to our piece of india-rubber tubing; whence the water, instead of forming a fountain, fills the house cisterns.
Get a common tap and take out the plug. Show the small holes in connection with this. Of course, this may be seen more plainly if we have a glass burette at hand with a stop-cock. If coloured liquid is poured into the burette and the stop-cock turned on and off, the function of a tap is at once demonstrated.	When the hole in the plug of the tap comes into line with the pipe of the other part, there is nothing to prevent liquid running through. When the tap is turned off, the hole in the plug is at right angles to the pipe of the other part, and the path is thus closed.
Take the tap of a cistern with the ball-cock attached. Let one of the children try how easy it is to turn the tap off and on by means of the lever-arm. Show also that the ball-cock is hollow.	The ball-cock, being hollow, floats on the water in the cistern. The long lever-arm makes the tap easy to turn on and off. As the water rises in the cistern it floats the ball-cock up, and this turns off the tap.

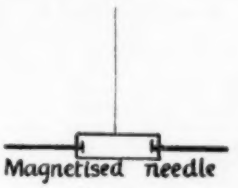
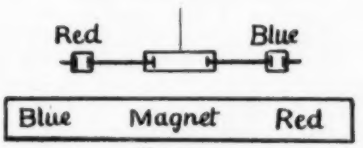
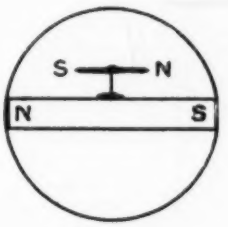
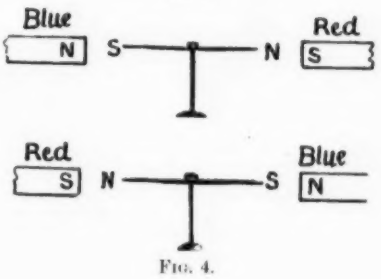
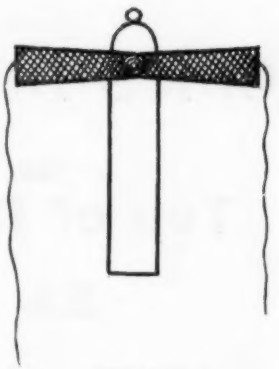
☞ **In order to make the pages of "The Practical Teacher" specially interesting and seasonably helpful, OUR JULY ISSUE will contain, in addition to the usual features, a number of EDUCATIONAL HOLIDAY CONTRIBUTIONS.**

HOW TO TEACH MAGNETISM AND ELECTRICITY AS A "SPECIFIC SUBJECT."

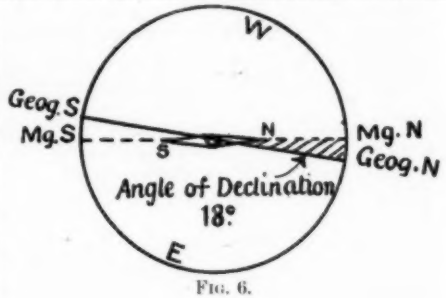
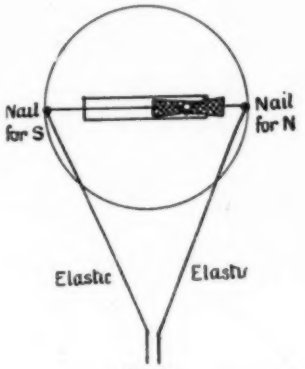
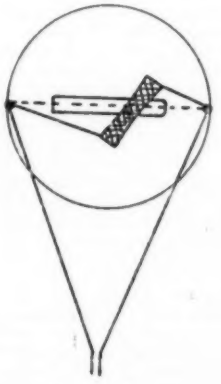
By B. ELDERKIN, *Model School, Westminster Training College.*

FIRST YEAR'S COURSE.—MAGNETISM—Lesson 11.—Terrestrial Magnetism.

Apparatus.—Magnets, knitting-needle broken in two, cotton and paper carrier, a toy mill model as described, magnetic needle, hammer and two small nails.

Matter and Truths Taught.	Methods of Teaching.	Diagrams as Illustrations.
I. *Preliminary Experiments.* 1. A magnetized needle, if held *centrally* over a bar magnet, will— (*a*) Turn round until its axis is parallel with that of the magnet. (*b*) Come to rest with its poles pointing in opposition to those of the magnet.	Magnetize the half knitting-needle; then balance it in a small paper carrier (Fig. 1). Mark N. and S. poles of bar magnet with blue and red paper, and lay it on table. Hold the knitting-needle over the centre of magnet; class to watch its movement until it comes to rest. Test for its polarity. Mark these blue and red, and Fig. 2 will represent what has happened.	 FIG. 1.  FIG. 2.
2. It does this in conformity with the laws of magnetic attraction and repulsion.	2. Question reasons from class.	
II. *Truths applied to action of a Horizontal Magnetic Needle.* (*a*) The needle always sets in a certain direction with regard to the N. and S. poles of the earth. (*b*) It does so because the earth has magnetic properties, which act on the magnetic needle in the same way as the bar magnet acted on the knitting-needle.	(*a*) The truth is not new. The reason has to be discovered. (*b*) If the earth be regarded as a globe with a bar magnet running through its centre, the analogy is at once seen (Fig. 3). This is not the exact magnetic state of the earth, but for experimental purposes it may be so conceived.	 FIG. 3.
(*c*) The earth has two magnetic poles, which act by attraction and repulsion upon the poles of a magnetic needle on the earth's surface. (*d*) Investigation shows that the magnetic needle does not necessarily point to the geographical N. pole of the earth. It varies for different places. This is probably owing to the *unequal distribution* of the *magnetic property* in the earth's matter, and to other causes.	(*c*) This cannot be shown experimentally, but with the aid of the experiment (Fig. 2) it may be reasoned out. There will be some difficulty in explaining the apparently anomalous condition of attraction between the N. pole of the earth and the N. pole of the needle, and also between the two S. poles. The confusion is in *name* only. If we call all the poles *blue* and *red*, instead of N. and S., the confusion is prevented (Fig. 4).	 FIG. 4.
(*e*) If a line could be drawn through the axis of a needle at rest and continued to the pole of that hemisphere of the earth, we should have what is called a magnetic meridian of the earth. (*f*) The angle of divergence which a magnetic needle makes with the geographical axis of the earth is called the angle of declination. That angle is for England 18° W. of true N.	Points *a*, *b*, *c*, *d*, *e*, and *f* may be comprehensively illustrated by a home-made model in the following manner:— Get a small toy mill and break off two of the sails. Attach about half a yard of elastic to the end of each sail (Fig. 5).	 FIG. 5.

MAGNETISM—Lesson 11.—(*Continued*).

Matter and Truths Taught.	Methods of Teaching.	Diagrams as Illustrations.
Summary of Facts and Definitions. 1. A magnetized needle always comes to rest pointing to one of the magnetic poles of the earth. (N. pole for N. hemisphere of earth; S. pole for S. hemisphere of earth.) 2. The *magnetic N. pole* very rarely coincides with the geographical N. 3. A *magnetic meridian* is an imaginary line drawn through the axis of a magnetic needle at rest and continued to the pole of the earth. 4. The *angle of declination* is the amount of divergence between a magnetized horizontal needle at rest and a geographical meridian passing through the centre of the needle. 5. The angle of declination, which varies for different parts of the earth's surface, is 18° W. of N. for England.	Lay a blackboard flat on a table. Describe a large circle from centre of the board to represent the earth. Place the magnetic needle exactly over the centre of the circle, and allow it to come to rest. Draw a chalk line from the N. pole of the needle to the circumference of the circle. This gives the N. pole of the earth. Mark this point *magnetic N. pole*. Repeat this for S. pole. Drive a small nail in each of these two points. Now measure off 18° to the E. of the nail for the N. geographical pole. Draw a line from this point back to the centre of the circle. This gives the angle of declination (Fig. 6). Now remove the magnetic needle and put the toy mill *on its back* in its place. Pass one elastic round the N. nail and the other round the S. nail. Stretch the two elastics by pulling both equally, and you have a visible illustration of the earth's attraction on the magnetic needle (Fig. 7). While pulling the elastics, allow a scholar to try to turn the mill round either way (Fig. 8). He will be able to do so, but will have to exert force. A corresponding force pulls the mill in a line with the elastics the moment he relaxes his hold. In Fig. 7 the elastics represent a meridian. NOTE.—The elastic, while stretched, can only represent *attraction*. The repulsion which acts in the needle also assists to bring it into the meridian. This apparatus is so valuable in explaining the dipping needle, that every teacher is advised to make it.	 FIG. 6.  FIG. 7.  FIG. 8.

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WHILE THESE NOTES ARE WRITTEN SPECIALLY TO MEET THE REQUIREMENTS OF CERTIFICATE CANDIDATES, THEY WILL BE FOUND USEFUL BY ALL TEACHERS WHO HAVE TO PREPARE FOR EXAMINATION IN THIS SUBJECT.

CHILDREN'S AND GIRLS' KNICKERBOCKERS.

(*a*) *Cutting-out.* Prepare a paper shape, either by measurement or proportion, as in Fig. 1 or Fig. 2, and then cut the shape out in calico or other material.

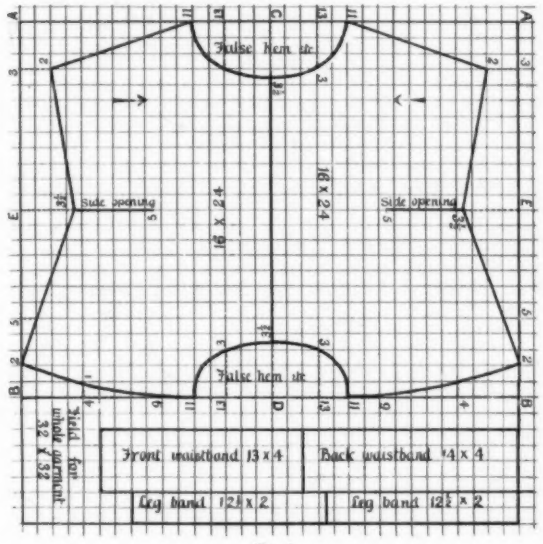
False hem st.
Side opening
18 x 24
Side opening
False hem st.
Front waistband 13 x 4
Back waistband 14 x 4
Leg band 12½ x 2
Leg band 12½ x 2
Field for whole garment 32 x 32

Fig. 1.

(*b*) *Placing of seams.* Place the two legs opposite each other, as in Fig. 3. Have the *backs* lying with the right side *downwards*, and the *fronts* up with the right side *upwards*.

If made of calico, a sew-and-fell or run-and-fell seam will be used. Begin the fixing of the *left* leg at the *foot hem*, where the asterisk in Fig. 3 is; and that of the *right* leg at the *top* of the leg curve. Fold on the *right* side a turning ¼ inch wide, then another to the *wrong* side ¼ inch. On the back curve of the leg turn down ½ inch to the inner or wrong side. Place the two folds above each other, and sew neatly. The seams of *both* legs must fall either to the back or to the front, but not one to the back and the other to the front; in other words, the seams must match in width, and the top-sewing stitches on one leg must be in a line with those on the other. Fix the two front and the two back curves together in the same way, and sew and fell them neatly.

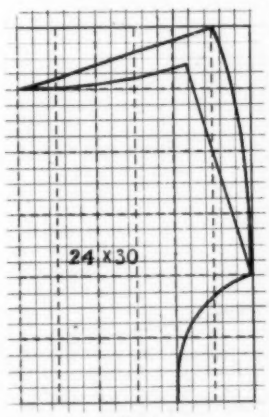

Fig. 2.

(*c*) *Side openings.* The length of the side openings is generally one-third of the length of the garment; in a leg of 18 inches the slit would be 6 inches.

These side openings may be finished in different ways.

Hems, about ¼ inch wide, tapering to the end of the slits, may be put on both back and front, and the foot of the opening protected by a shaped strengthening-tape (see Fig. 4); or by a gusset similar to that used for the seams of a man's shirt, as in Fig. 5; or by a binder, as in Fig. 6.

A wide and narrow hem may also be used. Put a broad hem, ⅝ inch when finished, on the back of the opening, and a narrow one, ¼ inch, on the front sides. Lap the back hem over the front one, and finish at the foot with two rows of stitching. (See Fig. 7.)

The strongest and neatest, though most tedious, way is to put on false hems on both sides. False hems, ⅝ inch broad when finished, are put on the backs; and a double false hem, ½ inch broad, is put on the fronts. (See Fig. 8.)

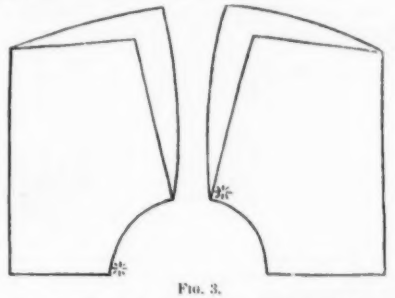

Fig. 3.

(*d*) *Kneebands.* The fullness at the knee should be so arranged as to bring it to the front of the leg, and from 1½ inches to 2

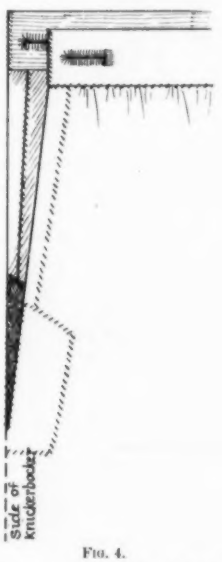

Fig. 4.

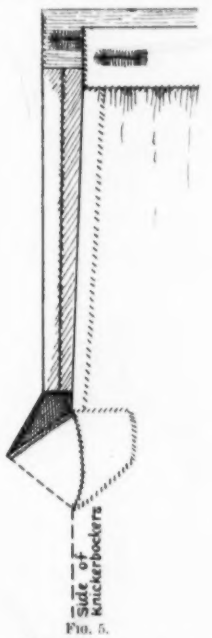

Fig. 5.

inches at least should be left on each side of the seam to prevent any dragging at the knees. Gather or pleat according to

Fig. 6.

Fig. 7.

the material. The bands may be open or closed. They may

be finished with one row of feather-stitching down the centre, or with a row on each side, as in Fig. 9.

More elaborate bands may be made by tucking and feather-

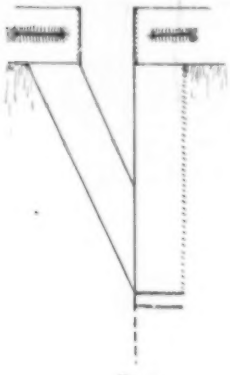

Fig. 8.

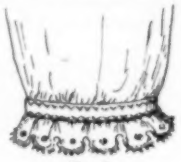

Fig. 9.

Fig. 10.

stitching, or by embroidery insertion, *as* described in the March number for combinations.

(c) *Waists and waistbands.* From 2 to 3 inches should be left plain on each side of the openings. (See Fig. 12.) Gather in the

Fig. 11.

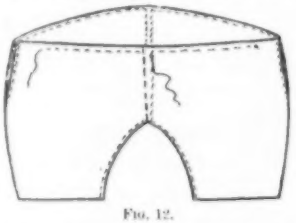

Fig. 12.

usual way. Some prefer to leave 2 or more inches plain on each side of the front seam, so as to have no fullness in the front at all.

To make the bands, turn down the weft sides first for $\frac{1}{8}$ inch, and then the selvedge ones to the depth of $\frac{1}{4}$ inch. Seam the ends, and halve and quarter the bands.

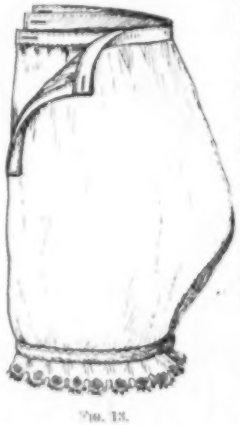

Fig. 13.

See that the edges of the slits are fitted carefully into the corners of the bands so that they are in a line with each other. Hem on the plain parts, and set in the gathers in the usual way.

Fell down the wrong sides. A row of stitching may be worked $\frac{1}{4}$ inch from the edge to strengthen the band. Five buttonholes are at least necessary for children's knickerbockers—two for the back and three for the front. Arrange the front ones as in Fig. 14; and

Fig. 14.

notice to make the centre buttonholes with two bridged ends, while the end ones should have a rounded and a braced end: the latter must be nearest the centre of the band.

If open bands are used, lap the ends over for $1\frac{1}{2}$ inches or 2 inches before halving and quartering; work the buttonhole on the right-hand side of the band, and sew the button sufficiently far over on the left-hand side of the band to allow for the overlapping.

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STANDARD V.

Lesson XXIV.

AERATED WATERS AND ALCOHOLIC BEVERAGES.

WHAT is meant by an aerated water? I think a glance at the glasses of water before you will give you some idea.

The first one contains cold water which has been boiled. Observe how dull it is to the eye; taste it, and it is equally dull or flat to the palate. Glass number two contains cold water drawn from the tap. This is clear, sparkling, and refreshing to the taste. Our third glass is empty at present; let us fill it from the siphon of soda water which stands close by. What a rush and a fizz, and how bright and sparkling is the water!

To what is this difference due?

You have heard of the presence of carbonic acid gas in air, and have learned to consider it an evil if present in any quantity. In water, however, the case is reversed: the greater the quantity of CO_2, the more sparkling and pleasant is the water.

Boiled water is dull and flat because during boiling the carbonic acid gas is driven off. Water in its ordinary state, as drawn from the tap or taken from the well, contains a small amount of CO_2. Aerated waters are artificially charged with a very large proportion of CO_2, and that is why they are so bright to look at and so sharp to the taste.

A simple *experiment* will demonstrate to you that CO_2 is really present in aerated water. Put a little freshly-drawn soda water into a test-tube, and heat it over a spirit-lamp; observe that bubbles of gas rise and escape freely. Put a lighted taper into the test-tube above the level of the liquid, and it is extinguished by the carbonic acid gas as it escapes.

The difference between one aerated water and another is due to the particular flavouring agent it contains. Soda water should contain thirty grains of bicarbonate of soda to each pint of water; as a matter of fact, however, much of what is sold as soda water is merely carbonic acid gas and water. Lemonade is made by adding lemon juice, essence of lemon, or sometimes citric acid. Potash water contains potash.

Aerated waters are increasingly popular. Their refreshing and pleasant properties, coupled with their non-intoxicating character, render them favourite summer and ball-room beverages. Some aerated waters, such as soda water and many of the natural waters, are used medicinally with good effect; but perhaps the chief point in their favour is this—carbonic acid under pressure is a poison to most of the micro-organisms which infest water; consequently, aerated waters are, as a rule, entirely free from the dangerous germs which are the cause of typhoid fever, cholera, dysentery, and other water-borne diseases. Their use in the place of water is especially valuable in countries where the water supply cannot be depended upon, and in times of epidemic disease.

Although generally harmless, aerated waters may, under some circumstances, be injurious in their effects. For instance, if the water used in their manufacture be impure, the beverage will be impure too; or the CO_2 may be prepared from improper materials, and the beverage thus rendered harmful; or again, copper and lead are sometimes dissolved from the vessels in which the waters are prepared, or from the fittings of the siphons in which they are stored. These dangers are, however, of such rare occurrence that they may fairly be left out of consideration.

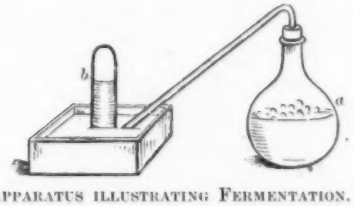
Alcoholic Liquors.—From aerated waters to alcoholic liquors is a sudden jump, for the latter all agree in possessing more or less of that dangerous spirit *alcohol*.

Do you wish to know what alcohol is like? Here is a little I bought from the chemist. Observe that it is in a bottle labelled conspicuously "*Poison*." That label tells its own tale, and warns us off from the deadly contents. In appearance alcohol is innocent enough, for it is as clear and colourless as water itself. But its smell betrays it; that sickly, clinging odour characterises all the beverages into which alcohol enters, and pervades the breath of all who take alcoholic beverages. Put a little alcohol into a saucer, dip the tip of your finger in it, and put it to your tongue. How sharp and biting it is! Rub a little on your hand; it rapidly evaporates, leaving your skin quite cold—for alcohol is very volatile. Pour a little more into the saucer, and let us see in what other particulars it differs from water. If I hold a lighted taper over a saucer of water, it burns steadily, and the water remains unchanged. If I put the taper into the water, it goes out; but when I replace the saucer with one of alcohol, and hold the light near the surface of the liquid, the alcohol catches fire, and burns with a blue flame until it is quite used up. What a fiery substance to introduce into our delicate digestive organs!

A second *experiment* will show how alcohol acts upon food. Break an egg into a glass, and add a little alcohol. The clear, transparent albumen at once begins to change to an opaque, hard, white mass, which you know from earlier lessons to be difficult of digestion. The fact is that alcohol has a remarkable affinity for water, and by robbing the albumen of its water, thus changes it in character.

Look next at this piece of flesh from the physiology cupboard. It is so hard, dry, and inflexible that you can scarcely believe it to have been at one time soft and pliable. The reason for the change is found in the fact that it has been kept in a jar of methylated spirit, which, by the way, is a cheap form of alcohol with the same properties. You have seen enough of alcohol now to recognise its dangerous nature. Sometimes alcoholic beverages are called *fermented liquors*. This is because in the course of their preparation they have undergone the process of *fermentation*, which I think I can make clear to you by means of one or two experiments.

Here we have a flask containing a solution of sugar and a little brewer's yeast. It has been standing near the fire for some time, so as to keep it warm. Watch the apparatus, and you will see bubbles of gas rising into the inverted tube and displacing the water. Let us find out what gas this is, for there is a considerable quantity now in the tube. Quickly reversing it, thrust a lighted taper into the tube, and the flame is extinguished; pour a little clear lime water into it, and the liquid becomes milky. These two facts indicate to us that CO_2 has been given off from the mixture of sugar, water, and yeast. Were we to filter the contents of the flask, we should obtain a clear liquid containing alcohol.



APPARATUS ILLUSTRATING FERMENTATION.

a Flask containing sugar solution and yeast.
b. Inverted tube.

This is an illustration of the fermenting process, in which, as you see, alcohol and CO_2 have been produced.

We can prove in another way that alcohol is a product of fermentation. Into a tumbler of lukewarm water stir a little treacle, and then add a spoonful of brewer's yeast; leave it in a warm place for two or three days, and then examine it. You will first be impressed by the peculiar smell of the liquid, which you will recognise as that of alcohol; and on tasting the mixture, you will not be surprised to find that the sweet taste of treacle has given way to a sharp, biting flavour.

Briefly stated, this is what occurs in fermentation.

Yeast is a fungus, a very low form of vegetable life. If we examine it under a microscope, we find that it is made up of a number of oval cells, each cell being a separate plant, consisting of a cell-wall and jelly-like contents. This fungus possesses the power of splitting grape sugar into its elements, and rearranging these elements to form entirely different compounds—namely, alcohol and carbonic acid gas.

One molecule of grape sugar is made up of 6 parts carbon, 12 parts hydrogen, and 6 parts oxygen, written $C_6H_{12}O_6$. What the yeast does is to take enough carbon and oxygen to form two molecules of carbonic acid, and with the rest to form two molecules of alcohol (C_2H_6O).

In the manufacture of most fermented liquors the CO_2 is allowed to escape into the air, while the alcohol remains in the liquid.

Alcoholic Liquors are divided into three classes—

1. Beers, ales, and porters, or malt liquors.
2. Wines.
3. Spirits.

Malt Liquors are prepared in the following way.

We have seen that sugar is necessary to the process of fermentation. In the manufacture of malt liquors the sugar is obtained in rather a roundabout way.

If we were to boil starch with a very weak solution of sulphuric acid, we should find eventually that it had been changed into sugar. Knowing this, it is not surprising to find that the starch of cereal grains may be similarly changed.

Barley is the cereal specially chosen by the brewer. In the hands of the maltster it is passed through a process known as malting, in which, under the influences of heat and moisture, it sends forth green sprouts, or, in other words, germinates. If we taste a grain of barley at this stage, we find it has acquired a sweet taste, for during germination the starch has been changed into sugar by nature's own forces. The grains of barley are now called malt, and after the sprouts have been broken off and the malt dried, it is handed over to the brewer.

Process of Brewing.—Here it is crushed, and soaked in warm water, and then boiled. Hops are next added to give bitterness to the beverage, and the liquid is run off into shallow vessels, called fermenting tuns, where it cools. Fermentation is the next process, and to this end yeast is added, and left for six or eight days to do its work of producing alcohol and CO_2.

Wines are made in a different way. In their case the necessary sugar is obtained from the juice of the grape, and the fermenting agent from a fungus which exists in the air.

The juice is pressed from the grape and exposed to the air until fermentation is complete. It is then bottled or put into casks. Sparkling effervescing wines are bottled before fermentation is complete, and the carbonic acid gas is thus imprisoned.

Some of the best known wines are champagne, port, sherry, claret, and burgundy.

Spirits contain much more alcohol than either malt liquors or wines. They are little more than alcohol and water, with a little flavouring to give them character. They are made by the distillation of wine or any other liquid which has previously undergone fermentation.

Look at the diagram, and you will understand how distillation is carried on. The retort, *a*, contains wine. The end of the retort is continued into a coiled tube, *c*, which passes through a container, *d*, filled with cold water, and leads to a receiving vessel, *e*. Underneath the retort is a heating apparatus, *f*, which heats the wine in the retort.

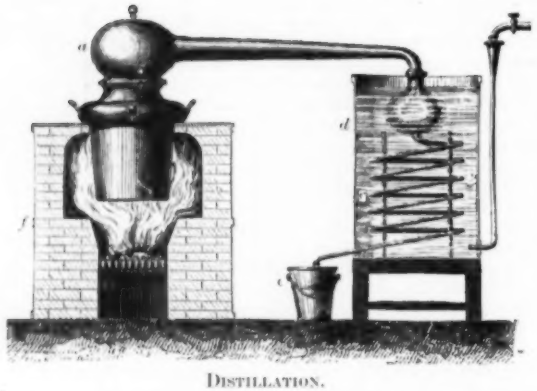
Alcohol boils at a lower temperature than water, and is therefore earlier driven off as vapour. The evaporated alcohol passes into the coiled tube or "worm," is there recondensed into liquid form by the cooling influence of the water in the container, and then falls into the receiver.

It is, of course, important that the contents of the retort never reach the boiling point of water, or we should not get pure alcohol.

The chief spirits are—

1. Brandy, made by distilling wine.
2. Whisky, made from malted grain.
3. Rum, made by the distillation of fermented molasses.
4. Gin, distilled from malted grains, and flavoured with juniper berries and oil of turpentine.

The *effects of drinking alcoholic liquors* may be summed up



DISTILLATION.

in a few words. In small quantities these liquors serve for a time to stimulate digestion, circulation, and the mental powers; but very shortly these effects cease unless the quantities be increased. This leads on to the excess which is fraught with so much pain and misery to mankind. If taken unduly, the effect of alcohol is to weaken all the powers, and ultimately to destroy them. Ruined digestion, loss of will-power, nervous diseases, weakened kidneys, and insanity are all brought about by over-indulgence in alcoholic liquors. How much better to make a practice of avoiding them altogether than to run such risks!

SUMMARY.

Aerated waters contain a large amount of CO_2. They include soda water, potash water, seltzer water, lemonade, etc.

Alcoholic liquors contain alcohol, produced in them as a result of fermentation. They include malt liquors, wines, and spirits.

Fermentation consists in the splitting up of grape sugar by the action of yeast or of a natural fungus into alcohol and CO_2.

Malt liquors are prepared from malted grain by the action of yeast. They include beer, ale, and porter.

Wines are produced by the fermentation of the juice of the grape. They include champagne, port, sherry, claret, etc.

Spirits are distilled from fermented liquors. They include brandy, whisky, gin, and rum.

Effects of Alcohol on the System.—In small quantities it stimulates the digestion and circulation; in excess it weakens and destroys the tissues and impairs the functions.

ELEMENTARY LESSONS IN THE PRINCIPLES OF GRAMMAR.

BY JOHN R. TIMSON, B.A.,
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LESSON VIII.

ASSERTIONS, TENSE, VERB "TO BE."

WORDS are like spectacles or telescopes. They enable us to see something. They have been called pictures of things. When I look at a photograph of a friend, I almost think I can see him. But the photograph is not my friend himself. It is the same with words. If my friend is named, I at once think of him, and imagine I can see him. The word "horse" brings to our imagination the real animal.

We must then learn to look through words to the things the words represent. This is the task of the hearer or receiver of words. But the speaker thought of the *things* first, and then represented them by *words*.

I know a man named John Smart. I also know that he is a saddler. To tell you this I say, "John Smart is a saddler." You "look" through the name John Smart, and think of the man; you "look" through the name "saddler," and think of a man employed in a certain work. But when you "look" through the word "is," you think of me, the speaker, as giving you my "word" for the fact that the work of a saddler is the occupation of John Smart.

We must always consider the speaker, and how far we can rely on his word, before we accept his assertion. Suppose some one says to us, "Ink *is* white," and knowing that it is black, we reply, "It is not. We cannot take your word for it, for we see that it is black."

The "is" of the speaker is his word or assertion only, and means simply "I say."

We must not believe what every one says; we must consider who makes the assertion. To study language and leave out of thought the speaker is like buying things without troubling who made them and how they are made.

The name of anything, together with a word indicating a speaker's assertion about it, forms a sentence. If true, a sentence represents a fact.

A sentence is the knowledge or thought of a speaker expressed in words.

A sentence is an assertion or a statement about something:—

The ink is black.

Ink.....The name of the fluid concerning which the assertion is made.
Is.....The word of the speaker.
Black...The indication of the colour asserted.

The full assertion consists of—

1. The word of the speaker, "is," meaning "I say."
2. That which denotes what is asserted, "black."

The whole assertion "is black" is called the predicate. The Latin word *predico* means "I say" or "I assert." The thing spoken about is called the subject. The names *subject* and *predicate* were given by scholars who used the Latin language.

All things exist in time and place. We make three divisions of time. Time *now* is called the present, time *gone by* is called the past, and time *to come* is called the future.

A speaker may indicate time in his assertion. The ink *was* black. "Was" indicates past time. It means—

"I say of time gone by."

In verbs the distinction of time is called tense.

The verb by which a speaker asserts of past time is said to be in the past tense.

There are three principal tenses:—

1. *Present* tense.....The ink *is* black.
2. *Past* tense.....The ink *was* black.
3. *Future* tense.....The ink *will be* black.

"Is," "was," and "will be" are parts of one verb, the verb "to be." This verb "to be" has many other forms, and some of them we must now learn. Remember the verb "to be" shows that a speaker makes an assertion. By it he indicates that he is putting his thought or opinion into words. He thus forms a sentence.

We can best discover the parts of any verb by using the six pronouns, I, thou, he, we, you, they, for subjects.

I.....First person, singular number.
Thou.....Second person, singular number.
He.....Third person, singular number.
We.....First person, plural number.
You.....Second person, plural number.
They.....Third person, plural number.

We also use "you" for single persons, but for the present we will consider it as being of the plural number only, and use "thou" for a single person addressed.

If a speaker asserts "hungry,"—

1. Of himself he says, "I *am* hungry."
2. Of the person he speaks to he says, "Thou *art* hungry."
3. Of another person he says, "He *is* hungry."

Of more than one he would say,—

1. We *are* hungry.
2. You *are* hungry.
3. They *are* hungry.

The verb "to be," then, sometimes takes separate forms to indicate number and person.

We must thoroughly commit to memory—

VERB "TO BE."

Present Tense.

I am.	We are.
Thou art.	You are.
He is.	They are.

Past Tense.	
I was.	We were.
Thou wast.	You were.
He was.	They were.
Future Tense.	
I shall be.	We shall be.
Thou wilt be.	You will be.
He will be.	They will be.

OUR NEWSPAPER NOTEBOOK.

THE SAMOA ISLANDS.

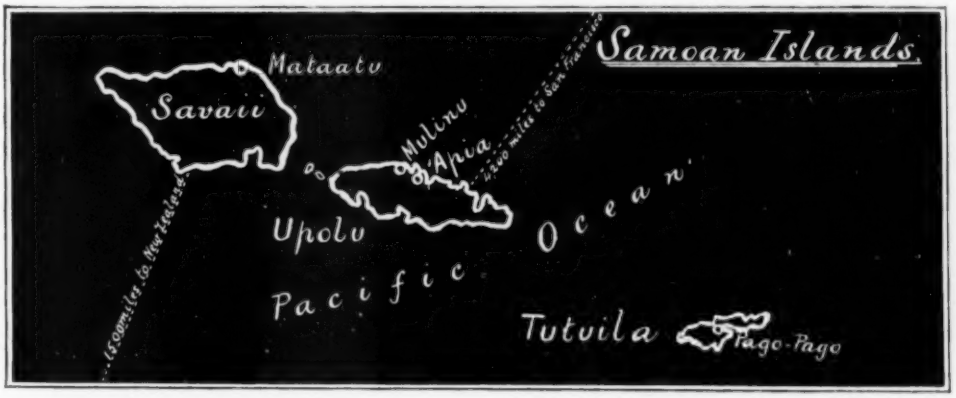
THE Samoa Islands were known to the Dutch as early as 1722, and Bougainville, the French navigator, visited them in 1798, giving them the name "Isles of the Navigators." They remained but little known, however, until 1830, when the London Missionary Society sent out agents.

The islands are really a line of extinct volcanoes, ten of which are inhabited and two uninhabited. Only three are of any size—Savaii (700 square miles), Upolu (550 square miles), and Tutuila; the total area is about 1,076 square miles. *Apia*, in Upolu, is the capital.

The climate is moist, and from November to May hurricanes are frequent. The soil is rich, and very productive. The vegetation is luxuriant. The cocoa-nut, banana, and bread-fruit trees provide the staple food of the inhabitants; but cotton, coffee, sugar-cane, tobacco, and cacao are cultivated. *Copra* (cocoa-nut dried and ground) is the only export.

The Samoans belong to the brown Polynesian race, and are of good physique and prepossessing appearance. They are of mild disposition, and well disposed to foreigners, with a strong leaning to the British. The native clothing consists chiefly of apron-like garments made of leaves, and the men are usually elaborately tattooed. To get a good idea of a Samoan house, imagine a gigantic beehive thirty-five feet in diameter and one hundred feet in circumference elevated on a number of short posts four feet apart, the spaces between which are filled in at night with roughly-plaited leaf blinds. The total population is about 35,000, half of whom are in Upolu. In 1895 the foreigners numbered only 400; of these 203 were British, 120 German, 26 American, and 26 French.

It was in 1889 that Samoa commenced to loom larger on the public horizon than the size of the islands or their general importance seemed to warrant. In the month of March the harbour at Apia contained seven ships-of-war—three American, three German, and one British, H.M.S. *Calliope*. The tension of affairs was such that the American and German vessels cleared for action; but a terrific hurricane arose, during which the coral-edged and coral-lined harbour became a seething cauldron in which crowded shipping could not live. The ships were dashed against each other, and either foundered or became total wrecks on the beach. By almost superhuman efforts the *Calliope* fought its way against the storm, through the narrow entrance to the harbour, out to sea, and was saved, the magnificent seamanship eliciting ringing cheers from the helpless and doomed American flagship.



Later in the year, at a Conference held at Berlin, the neutrality of the islands was guaranteed; the citizens of Britain, United States, and Germany were to possess equal rights of residence, trade, and protection. All civil suits concerning real property, and all civil suits between natives and foreigners, or between foreigners, were to be referred for settlement to the Chief Justice, who is nominated by the three powers: the present Chief Justice is an American. The American coinage is the recognised standard of exchange, but British gold and silver are almost exclusively used, at the rate of 4s. to the dollar.

Notwithstanding all these arrangements, the results have been far from satisfactory, and Samoa remains in a state of continual unrest and ferment, largely owing, it is said, to the duplicity of the German representatives.

In 1890, Robert Louis Stevenson, the celebrated novelist, settled on a property on the mountain behind Apia, to which he gave the name Vailima (five rivers). A speech he made to the chiefs, on the opening of a road constructed by native labour for services he rendered to native chiefs during their captivity, is worth reproducing at this present juncture:—

"There is a time to fight and a time to dig. You Samoans may fight, you may conquer twenty times and thirty times, and all will be in vain. There is but one way to defend Samoa.....It is to make roads and gardens, and care for your trees, and sell their produce wisely, and, in one word, to occupy and use your country. If you do not, others will."

By the Berlin Treaty, Mataafa was excluded from the throne of Samoa, and Malietoa Laupepa reigned until his death, in November 1898. Mataafa had been exiled to the island of Jaluit, but was allowed to return in the latter part of last year, from which time the trouble has taken a more acute turn. The Chief Justice took evidence as to the claims to the kingship, and eventually decided in favour of Tanu, the son of Malietoa. The Mataafans, secretly abetted by the Germans, rose in revolt; four thousand warriors were organised by a retired German officer, and open warfare broke out. Tanu was overthrown in battle in January last: British blue-jackets landed to protect the Chief Justice, who sought refuge on H.M.S. *Porpoise;* and how matters will eventually end cannot yet be foreseen. News travels slowly from Samoa, for there is no telegraphic communication between the islands and New Zealand.

That three great powers will fall out seriously over these Pacific islands is not probable, though their value is not to be underestimated. When a ship canal across Central America is an accomplished fact, Samoa will form a useful commercial centre, and a strategic base of great value to a naval power; nor must we lose sight of the fact that it would form a desirable link in the proposed "all British cable."

The purely commercial aspect of the situation may be gleaned from the following figures:—

Imports (1897), £65,926, of which Britain and her colonies contributed more than half.

Exports, £47,839, of which Germany took less than £400.

THE INSPECTOR'S NOTEBOOK.

BY AN INSPECTOR OF SCHOOLS.

The Teaching of Spelling. THE second of the three R's comprises much besides mere penmanship, with which I dealt last month. Let us discuss this month the subsection of writing known as spelling. This subject, according to the Code, has to be seriously considered in Standards II., III., and IV. The course prescribed by the Code is briefly set down as follows:—"Six lines from one of the reading books of the Standard slowly read once and then dictated." In Standard IV. eight unseen lines are prescribed. We must not lose sight of the object, which is to teach children to spell correctly the ordinary words of everyday life.

* * * * * *

No Spelling for Infants. Spelling is learned by the eye and not by the ear. Our language is so full of words anomalous as to their spelling, that it is useless attempting to proceed entirely upon scientific lines. Infants ought not to commence spelling. Doubtless they will pick up casually, during their word-building lessons, a little in this subject; but such tasks as writing from dictation are foreign to approved educational methods. And yet one sometimes finds that pressure has been brought to bear by the head-teachers of the upper departments to obtain some preparation in the infants' department in the art of writing from dictation. It is no part of the duty of an infant mistress to teach spelling as such. It is not even required in Standard I.

* * * * * *

Resort to Dictation sparingly. Far too much time is still being given to dictation and spelling. It is waste of time to spend twenty or thirty minutes a day in dictating six lines from a reading book. Cut down your dictation lessons to one or two per week. Never dictate a piece until an opportunity has been given of learning the unknown words. Note what is said in the Revised Instructions upon the subject. This is the substance of it:—In Standards II. and III., the orthography of words of regular spelling, and anomalous words occurring frequently in conversation, only should be expected. In the higher standards, the correct spelling of technical terms and rare words ought not to be looked for.

* * * * * *

Teach Common Words and those used in everyday Talk. It has frequently happened that a lad who has passed the Sixth or Seventh Standard, and who has been able to spell many rare words, has made many blunders in the course of a short letter applying for a situation. This is what one wants to avoid. In some schools I visit, the teachers have carefully collected lists of the words used in ordinary conversation and in everyday letters. Every teacher should have the spellings for the year arranged, like the work in other subjects, in periods, and care should be taken in the selection of the words in each standard. In some schools five or ten minutes' spelling is taken daily, about fifty new words being learned each week. Pieces of dictation when required should be composed by the teacher, so as to make use of the words learned. If a piece is selected from a book, many of the easy words which you know the children can spell may be cut out.

* * * * * *

Make Spelling subservient to Composition. There is no reason why a little spelling should not be begun in Standard I. Let the children learn little words, and then use them in writing tiny sentences on their slates. And generally it is well to combine composition with spelling in all standards. In fact, the spelling might well be made almost subservient to the composition. This would be far more educational than the old style of sticking to dictation. The Code provides for an alternative composition course. I propose to deal with this section of writing next month.

* * * * * *

A few Remarks on Word-building. The word-building era has reached its zenith. It has already been discovered that this is not a panacea for the multitudinous difficulties of teaching spelling. Whilst it is very useful for the infants and lower standards, it is necessary to almost dispense with word-building in the higher standards. It must not be forgotten that word-building is only a means to an end. If after this method has been used the scholars are unable to spell, then it is not to be commended. One objection to it is that many uncommon and useless words are learned simply because they happen to rhyme with commoner words. Many of the most useful and commonest words are anomalous. The most successful system is a combination of all the known methods of teaching spelling.

* * * * * *

Transcription is a useful Exercise. Transcription is very useful, and rests upon sound principles. The eye is used, and the process demands concentration of attention. Variety of method acts well. Transcription requires careful supervision. It should be used largely in the two lowest standards. The pieces should be carefully selected, or a piece should be written on the blackboard. All the work should be examined.

* * * * * *

A Few Hints on Dictation. Lists of irregular spellings should be written out on sheets of cardboard. These can be placed in front of a class at odd moments. There are a few points to be noted in connection with dictation lessons. In the first place, too much time is usually taken up in the dictating. The children should never be encouraged to expect the words to be dictated more than once. It is well to time oneself when dictating a passage. If the class is large, let the scholars change books and mark the errors themselves, whereby time will be saved. The teacher should, however, pass round and actually see each book. If the dictation is a piece put together by the teacher, he should enter the piece in his notebook, underlining the words which have proved pitfalls. At the end of the period the misspelt words may be usefully recapitulated. Subjoined are two Bluebook opinions:—

What H.M. Inspectors think of this Subject. 1. "I suspect that spelling, as understood under the old system, has deteriorated; but by encouraging composition I hope that the children will be made familiar with the words that they ordinarily use. Word-building is very useful—or rather quite necessary—in the lower parts of a school; but in the upper standards our good servant becomes a bad master. How can you teach by rule such a sound as is found in the following: *bird, absurd, stirred, heard, word, furred, erred?*"

2. "Spelling has, I think, deteriorated; certainly it has where 'word-building' alone is relied on. I do not attach much importance to too great an accuracy in spelling; a certain accuracy is necessary for children, and a greater will follow if the child continues to read after he leaves school. He will most probably continue to read, if he is not disgusted with books owing to the manner in which he has been taught spelling during his school life."

* * * * * *

ANSWERS TO CORRESPONDENTS.

J.J.—He is a pupil teacher until he has failed twice at one of his examinations.

M.H.K.—Gregory's *Advanced Physiography.*

R.C.G.—The parchment certificate is now issued upon application at the end of eighteen months' service in one and the same school. It does not matter when the school year ends, but a favourable report from H.M. Inspector is necessary.

W.J.D.—Yes; the certificate issued upon the result of the Science and Art day examination in June is of equal value with that obtained upon the result of the May evening examination.

D.—Write to Messrs. Nelson and Macmillan for catalogues.

L.J.—I do not recommend you to study the special period only. You might, however, skim the period prior to 1066 and then commence to study seriously.

W.P.—Pleased to hear from you again. Let me recommend you to look into the curriculum of the Welsh intermediate schools. I do not think an organised science school would flourish under the circumstances. Could you not arrange for an organised science section at the top of your school? You do not say whether you wish to receive Government grants. If so, there is nothing between an ordinary higher-grade school taking specifics and the same with an organised science section.

L.W.L.—If you fail in the sciences in May, you will lose all the marks for group D. The successes gained in 1898 are of no use for July 1899. If you fail, you had better take geography and history.

SCHOLARSHIP FRENCH FOR 1899. LE TRÉSOR.

BY FRANÇOIS COPPÉE.

LITERAL TRANSLATION FROM THE ORIGINAL TEXT, WITH NOTES.

(*Authorised by Proprietors of the Copyright.*)

JEAN, * *speaking to himself, and handling the jewels.*

So this treasure is mine!
I see it, I touch it, and I cannot yet believe in-it...
Well, it is * good-fortune; "I must" profit of-it...

* * * * *

[*Want of space this month prevents our giving this scene in full.*]

VÉRONIQUE.

I have regret to disturb a so joyous dream,
Monsieur Jean, but I ought to make to-you my farewells (= to say "farewell").

JEAN, *amazed.*

Farewell!...You! I have badly understood (= misunderstood).

VÉRONIQUE.

No! my help
In future becomes (= will be) useless to-you, and I yield
To my former wish, which came back often,
To pronounce my vows and to enter in-the (note the *à*) convent.
My resolution since long is taken.

JEAN.

What will this say? (= what does this mean?)...You see my surprise...
Never[1] you not to-me had spoken of these plans...

VÉRONIQUE.

And yet, Monsieur Jean, I always (*lit.* all the days) thought of it (*y*, "to it;" not *en*, "of it"),
And I have not even here prolonged my presence
But[2] in your interest, and out-of gratitude.
It is even, in leaving you, the only happiness that I have
To have served (*or* waited upon) you...But all is "much" changed;
"They have" returned for you, the prosperous days.
Soon you will lead (= bring) under the roof of your fathers
A chosen wife (= a wife of your choice),* worthy of you
And of the women from whom come to you these jewels;
That-one whom you will be able to love as an equal,
And who will know-how to wear the ducal coronet (*lit.* crown),
She will take the place here which I occupied;
And I (I) enter * the convent in order to live in peace.

JEAN, *aside.*

I believe I divine (*or* guess) (*infinitive*) all...O poor wounded heart![3]

VÉRONIQUE.

Keep for me, is it not (= will you not)? a good (*i.e.* kind) thought;
I (*or* as-for-me), I will pray for you—it (*lit.* that) is all that I can ("do")
Henceforward. Have care (= take care) of my poor uncle; and then,
More late (= later on), when you are[4] ("the") father of ("a") family,
Perhaps you will see return the humble girl
Who always will have made for you fervent prayers (*lit.* vows, wishes),
And who will love you in your little children.[5]

JEAN.

To go away! You would go away from here, dear child (*lit.* little one)!
But at that thought[6] alone that I must leave you,
Do you know that my heart (has) shuddered with (*de*, not *avec*) dismay?
Let us both (*lit.* all two) sit down. See (= come)! listen to me.
My child, this treasure of which I seek the use (employment)
Has not only rendered me rich but wise (*or* sensible, prudent).
It has made fly-away, by a sudden gust (*or* puff),
That regret (*or* sorrow) which was not at the bottom but[7] vexation;
No echo of the past * vibrates in my soul;
And your former (*or* old) place at the fireside remains free...
Why do you wish, then, to forsake this spot?

VÉRONIQUE.

I have already told you (it). I must[8] consecrate myself to God.
And the quiet of the cloister is my sole desire.

JEAN, *with animation* (lit. *animating himself*).

Well! I tell you that it is false, Véronique!

VÉRONIQUE.

Monsieur Jean!...

JEAN.

Let me ("speak")...I tell you it is untrue.

* * * * *

VÉRONIQUE.

Why not speak but (*ne...que* = only) to-day,
Monsieur Jean? Yesterday still (= even) I would have said to you, Yes!

JEAN.

Well?

VÉRONIQUE.

But now that the lost honours (*or* grandeur)
By a just return are all given-back to you,
And that you find-again fortune (*or* wealth), title and name,
I know my duty, and ought (to) (*or* must) say to you, No!

JEAN.

What ("a") meaningless (or "an unreasonable") scruple! You love me; I love you...
To have (*i.e.* because I have) this treasure, am I not any longer the same?

VÉRONIQUE.

You will not be (it = so) to-morrow. No, Monsieur Jean.
I do not love a duke: I loved a peasant (*or* a farmer).
I had ("a") right to dream—but every beautiful dream comes-to-an-end—
To be (= that I should be) ("a") farmer's wife one day, never to be (= that I should be) ("a") duchess;
And that which with delight (*lit.* intoxication) yesterday I might have accepted,
All my (= my whole) heart repels (it) now through pride.

JEAN.

But this treasure, I owe it to you, O noble girl!

VÉRONIQUE.

No, Monsieur Jean: they[9] are your family jewels (*lit.* jewels of family).
For you alone the late duke—you * understand *—
Had hidden them there...I will not accept anything!...
I must * withdraw, having fulfilled my task.
If I listened to you, if I was cowardly enough
* Not to resist any longer, alas! what would * happen?
You would see that a child (= young girl) brought up in exile,
Who can[10] sew and spin like (as) a servant,
But who * is nowise worldly (= here, accustomed to society) nor learned,
In many-an occasion (= under many circumstances) which may[10] very-well arise
Would not keep (*or* maintain) her rank, and would make you blush...

JEAN.

Véronique!

VÉRONIQUE.

Wait!...Then the image of Irène,
Of whom you boasted the tact and the pride of ("a") queen (= queenly pride),
Would come ("and") inspire you with blameworthy regrets,
With (-the) (*N.B.* Genitive after *inspirer*) reproaches, perhaps...
And I, (I) should die *—
("No") more deceitful (*lit.* lying) dreams where (= in which) my hope * wanders!...
I swear it! for ever this treasure separates us;

---

* Articles, prepositions, etc., that are untranslatable are marked by an *.

[1] *Jamais*, "ever;" *ne...jamais*, "never." *Jamais* may mean "never," the negative being understood. *L'avez-vous vu? Jamais.* "Have you seen him (*or* it)? Never."

[2] *Ne...que* can generally be rendered by "only."

[3] Although *âme* = "soul," "mind," "spirit," it is often equivalent to "heart."

[4] Note the future tense.

[5] *Petits-enfants*, "grandchildren;" *petits enfants*, "little children."

[6] *Penser* is another and less usual form of *pensée*. *Penser* is the verb used as a noun, and expresses the act of thinking, while *pensée* is the thing thought.

[7] See Note 2.

[8] *Devoir* ("to owe," Lat. *debere*) implies more distinctly the sense of "duty" than *falloir*. *Je dois*, "I ought," "it is my duty."

[9] *Ce* is *lit.* "that." *N.B.* The verb *sont* agrees, not with the grammatical subject, *ce*, which is in the singular, but with the attribute of the proposition, *vos bijoux de famille*, which is plural.

[10] *Savoir* is "to know how;" *pouvoir*, "to be able." *Je puis patiner* and *je sais patiner* may both be translated, "I can skate." But a man who knows how (*savoir*) to skate may have a broken leg, which would prevent his being able (*pouvoir*) to skate. In the ninth line of second column, *saura* = *pourra*, *lit.* "will be able."

And you will have more quickly worn-out[1] these diamonds
Than you will (not)[2] have made me fail to ("keep") my oaths.

JEAN.

Ah, well, then! Be cursed by me, direful (*or* harmful) treasure!
Diamonds that disturb my lot, I detest you!
For you are fatal to-me; for you have cast
Upon my illusions your cold light (*lit.* clearness),
And, moreover, you render, by an invincible charm (or spell),
The heart of this child (= girl) like you insensible!

SCENE VIII.

JEAN, VÉRONIQUE, THE ABBÉ.

The Abbé enters in the greatest agitation, (in) brandishing a sheet of parchment.

THE ABBÉ.

My children! my friends!...

VÉRONIQUE.

(My) uncle!

THE ABBÉ, *throwing himself on Jean's neck.*

Embrace me,
My poor Jean!

JEAN.

Who can cause you so much emotion?

THE ABBÉ.

An unspeakable joy, an infinite pain!...
I (I) am going (away: *s'en aller*) to write a work of genius;
But you, if you found the treasure, ("my") dear fellow (*lit.* child, boy),
Alas! you would not be richer than before.

JEAN.

What—the treasure?

THE ABBÉ.

Now (*lit.* go) do not search-for the traces of it any further,
For in your garret (*or* lumber room), among your bundles-of-papers,
This rare document, this precious deed,
By the greatest chance (has, *lit.* is) fallen under my eyes.
It has ("just") proved to me (*lit.* it comes from[3] to prove to me)
That your illustrious ancestor...

Showing (i.e. *pointing to*) *the bust over the fireplace.*

Yes, that great captain,
Who seems to smile upon us in his beard[4] up there (*lit.* there-high)...

JEAN.

Well?...

THE ABBÉ.

* Is the tragic hero I want.

JEAN.

"For goodness' sake!" (*lit.* "of (your) grace, or mercy")...

THE ABBÉ.

This friend of the best of(-the) monarchs,
As one was preparing[5] for the battle of Arques,[5]
Knew that our free-lances, who since (= for) very long
Had not had their pay, were very discontented.
Then, O sublime trait in which (*lit.* where) his loyalty shines!
He sold to "some" Jews his family jewels (*lit.* jewels of family),
And paid the soldiers without informing[6] the king.

JEAN, *aside.*

What does he say?

THE ABBÉ.

One gained the battle (= the battle was won)...After which
Henri, who knew ("about" or "of") the fact, wished, as one thinks (= as is supposed),
To give the brave duke his just recompense;
But your ancestor, ("a") hero worthy of being[6] a Roman,
—The thing is quite at the length (*i.e.* in full) in this old parchment,
Made at Dieppe, and stamped with the arms of the town—
Refused everything, and made,[7] by a clever goldsmith,
Make[7] false jewels quite like (to-) the old ("ones"),
Wishing, as he said,* that the wives of his "people"[8] (*or* of his family)
Who might bear his name in(-the) future "days"
Might not have of (= any) other ornament than these vain adornments—
("A") lasting reminder which he bequeathed to their sons
Of that which he had done one day (= once done) for his country.

JEAN.

My noble ancestor!

VÉRONIQUE, *aside.*

Heavens! (*lit.* Good God!) do you (*lit.* is it that you) answer me (*or* grant my prayer)?

JEAN, *showing the chest to the Abbé.*

Thus, you have said it (= so), these ornaments are false.

THE ABBÉ, *amazed.*

These ornaments?...Ah! What—the treasure?

JEAN.

Here it is.
But you have proved to me that it was false...Thanks!

THE ABBÉ.

You had discovered it?...I destroy (= am destroying) your joy!

He lets himself fall (= *he falls*) *into an arm-chair.*

Ah!

JEAN.

I understand the gift which the ancestor sends me.
("A") treasure of devotion, ("a") treasure of loyalty.
You give-me-back (*or* render me) happiness with poverty;
And much more than all the gold of the world I esteem you,
Fortune of virtue, legacy of a sublime ancestor,
Be welcome (*lit.* be the welcome-ones), for you fulfil (crown, *lit.* heap) my wishes,
Pearls without sheen,[9] diamonds without lustre (*lit.* fires)!
For I have suffered during my hour of wealth,
And fate now makes me indeed ("an") ample recompense,[10]
Which, all in loading me (= while loading me) with this increase of honour,
Allows me to remain a poor reaper (*or* harvestman).
Go, without a regret ("from me"), illusive chimeras!

Taking the hand of Véronique.

You see the jewels which my grandmothers have worn (wore)!
It is my wedding-gift (*or* dowry). They have not "any" (*lit.* of) value,
And the brightness of your eyes shines more than theirs (*i.e.* their brightness).
Will you, however, accept them notwithstanding (*lit.* when even)?

VÉRONIQUE.

Since you remain poor, and since I love you!

THE ABBÉ, *springing from his arm-chair.*

What? (*lit.* how?)...What have I heard?

JEAN.

It is true. A thousand pardons!
We are loving (= we are in love with one another), and we agree (to marry),[11]
* Abbé! two poor people exchange their promise;
And you can do nothing (in it—*i.e.* in the matter)...but to say mass for us,
As if to marry (*i.e.* as if you were marrying) simple peasants.

THE ABBÉ.

A such marriage! (= what a union!)...Supreme (*or* crowning) honour of my old age (*lit.* years)!
But what (of) events!...I have my subject of (= for my) piece (*i.e.* play)...
One finds the chest (the chest is found)...you marry my niece...
The treasure was false!...Have I (*lit.* is it that I have) dreamt?

JEAN, *holding Véronique by the hand.*

The treasure ("false")? No! ("for") this is what I have found!

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[1] To use = *se servir de, employer.*

[2] Note this *ai*.

[3] Compare this idiom *venir de* with *aller*. *Je vais parler*, "I am going to speak;" *je viens de parler*, "I have just spoken."

[4] "In his sleeve" would not be appropriate here, as a bust, and not a person, is referred to. *Rire dans sa barbe* is "to laugh inwardly," "to laugh to one's self."

[5] At Arques, near Dieppe, Henry the Fourth, with a comparatively small force, defeated the army of the League (1589).

[6] Note again the infinitive in French where we use the present participle.

[7] *Fit faire*, *lit.* "made make,"—*i.e.* "caused to be made," "had made." Note this among many idiomatic uses of the verb *faire*: *Il a fait faire une paire de bottes*, "He has had a pair of boots made."

[8] *Lit.* of "the his." *Les miens*, "mine;" *les tiens*, "thine;" *les vôtres*, "yours;" *les nôtres*, "ours;" *les leurs*, "theirs."

[9] *Lit.* "East"..."radiance," but not of general application in this sense; limited almost to the opal tints of the pearl.

[10] We have adopted into English this word *largesse*, "a gift," "a bounty," for which we have no equivalent term.

[11] As Jean and Véronique are orphans, Jean makes the remark, "*Nous nous accordons*," playfully. He means to say, "Having no parents to intervene for us, *we give ourselves the one to the other.*" *Accorder* is, in French, a transitive verb, and is sometimes equivalent to *concéder*.

OUR TUTORIAL SECTION

THE L.L.A. OF ST. ANDREWS.

B.—THE DEPARTMENT OF PHILOSOPHY.

LOGIC AND METAPHYSICS.

BY THOMAS CARTWRIGHT, B.A., B.SC. (LOND.),
Author of "Mental Science and Logic for Teachers."

Berkeley, Section 67 to the end.

THE question under consideration here is the old one—namely, Is matter anything except attributes which are known to us by the sensations they excite in our minds? The common opinion of mankind says yes. But it is objected that even if such a substratum, noumenon, or support of attributes exists, it cannot be known to us through our senses, and therefore it cannot be known at all; so that we arrive at the position wherein is asserted knowledge of the unknowable, which is not only a contradiction, but also a contradiction in terms. We must, therefore, either give up our belief in the existence of matter, as Berkeley invites us to do, or claim that we can get knowledge otherwise than through the senses. The latter appears more rational than the former; and although it is not easy to clearly demonstrate the truth of this position, there is every reason to attempt to solve the vexed question. With respect to this, we may endeavour to prove (1) that we have a direct intuition of matter—that is, we know of its existence immediately that we become conscious, without any assistance from the sense-organs; or (2) that there are no uncaused phenomena, and that there must be some cause of the attributes, which cause we may claim to be the substratum; but what, then, is the cause of the substratum? Again, we may claim (3) that our senses are incomplete, and that therefore we only know of matter dimly because of this incompleteness in our sense-organs. Weighty objections can be opposed to these and kindred views; but so can we object to Berkeley's theory as a shock to common-sense. Observe what is said as to *occasion*, and notice how Berkeley works round to his view that *spirit* and *ideas* are the only two real things in existence, matter being nothing other than ideas provoked in our spirits by the Supreme Spirit. Read the note at the foot of page 95, and ask yourself whether we can "imply existence," as suggested by Fraser, or not.

With respect to religion, it is to be observed that in the hands of Hume and his followers the very same arguments that suffice to prove for Berkeley that matter has no existence, are used to prove also that there is no such thing as spirit; and so we have the agnostic position, instead of the unwavering belief that Berkeley opines will follow the propagation of his principles.

Carefully study the exposition, commenced on page 103, of "*ideas*" and "*spirits*" as understood by Berkeley. Note 2, page 105, is very important, and should be well read.

"It were a mistake to think that what is said here derogates in the least from the reality of things." What does Berkeley understand by "reality"? This ought to be made clear to the student's mind. Berkeley's "support" is, of course, Supreme Spirit and not concrete matter (section 91); but "*unthinking beings perceived by sense have no existence distinct from being perceived, and cannot therefore exist in any other substance than those unextended indivisible substances or spirits which act and think and perceive them.*" In this passage we have a definition of matter according to Berkeley's view. Let these words be well marked and digested, as it is of first importance that the student clearly understand what becomes of matter in the Berkelcian system. Read footnote 1, page 109, with respect to the effect of Berkeleism upon religion. Concerning the existence or non-existence of abstract ideas, the following note by Fraser is of exceeding great importance:—"*The substitution of facts—sensuous or spiritual—for empty abstractions is, with Berkeley, the beginning and end of philosophical method*" (page 113, footnote 2).

Remember that Berkeley's science is very weak (see page 117, footnote 1). Carefully peruse the conclusion given in section 107.

The question as to the existence of absolute space presents two aspects. In the first place, our knowledge of space, it may be conceded, comes by way of our perception of room for movement; so that motion and space are inseparably connected in our minds, as Berkeley claims. On the other hand, as Fraser says in the footnote to page 125, "it does not follow that the necessary mathematical relations embedded in concrete experience are unintelligible; experience of external things cannot be intelligibly formed independently of their relations under the intellectual concepts of geometry." The peculiar attention paid by Berkeley to "space" is explained in the footnote to page 126. The student need not labour at this portion of the treatise. All she need trouble about is to understand clearly how we get our idea of space. The remarks on infinite divisibility are well dealt with in footnote 1, page 131. It does not commend itself to reason that "a supposed infinitely divided extension, being in its state of infinite division unperceivable and unimaginable, must be non-existent." Great care should be taken in reading section 133, where the views of Berkeley are reiterated. The note to page 138 will also repay attention.

The question of the want of another sense whereby knowledge of the substratum and of spirit could be obtained by way of sense impressions has been referred to several times. It may be observed that **intuition** approximates to this, in so far as it is supposed to give us knowledge not depending upon the deliverances of the sense-organs. Note the very different way in which Berkeley (section 137) claims we come to know spirit, as opposed to the way in which we are supposed to get our knowledge of matter. We know ourselves because we know—that is, the very fact of knowing implies the existence of a sentient being, as Fraser puts it in footnote 2, page 141: "As I am presupposed in all my knowledge, I cannot be ignorant of myself." The followers of Hume used Berkeley's arguments against a belief in the objective existence of self. Berkeley says objects are simply bundles of sensations, so that we have no right to believe in the existence of anything except attributes. Hume agrees with this; but at the same time he goes a step further, and says: When I examine what I mean by myself at any time, I find that it simply amounts to a number of conscious states—thoughts, feelings, and volitions—so that there are as many "selves" as there are groups of mental states, and there is just as much reason for believing in the existence of a self which is something other than conscious states, as there is for holding that there is a substratum in every object which is other than sweetness, whiteness, extension, etc. When I am unconscious, then I do not exist, is the paradoxical inference from this reasoning as to meaning of self. Fraser deals with the question admirably in the long note on page 143, to which the student is referred, and in addition to which nothing need be added here. Note 2, page 145, is to be read carefully in this connection, especially that "what he (Berkeley) says goes rather to establish that we find in the fact called *self* that to which there is nothing analogous in the phenomena of which we are percipient in our five senses." This may readily be conceded; but how far it falls short of explaining clearly what the meaning of "self" really is! Attention may again be directed to abstract ideas. The student must know this part of her work well, as so much of Berkeley's argument depends upon a thorough grip of what he means in denying that there is such a thing as an abstract idea. The note at the foot of page 147 is extremely important, especially the latter part: "The difficulty still is to understand *how* the phenomena of which I am conscious when I use my senses—if they are self-contained and numerically different from those of which any other mind is conscious—can be media of communication with another mind." Berkeley is very weak here. Note the following:—"A human spirit or person is not perceived by sense, as not being an idea. When, therefore, we see the colour, size, figure, and motions of a man, we perceive only certain sensations or ideas excited in our own minds; and these being exhibited to our view in sundry distinct collections, serve to mark out unto us the existence of finite and created spirits like ourselves. Hence it is plain we do not *see*

a man—if by *man* is meant that which lives, moves, perceives, and thinks as we do—but only such a certain collection of ideas as directs us to think there is a distinct principle of thought and motion like to ourselves, accompanying and represented by it. And after the same manner we *see* God; all the difference is that, whereas some one finite and narrow assemblage of ideas denotes a particular human mind, whitherscever we direct our view we do at all times and in all places perceive manifest tokens of the Divinity—everything we see, hear, feel, or otherwise perceive by sense, being a *sign* or *effect* of the power of God, as is our perception of those very motions which are produced by men." The footnote to this passage (page 149) deserves careful reading, and the passage itself should be gone over again and again until thoroughly well grasped and remembered.

The term Nature is very misleading. Observe well the two meanings discussed by Berkeley—(1) *the visible series of effects or sensations* imprinted on our minds, according to certain fixed and general laws; (2) some being distinct from God, as well as from the laws of nature, and things perceived by sense. The latter, of course, is unthinkable; and the former, according to Berkeley, cannot produce anything at all. The Biblical meaning of nature is "the immediate hand of God," which squares very well with the idea of the plain man who would say that the order of nature means the way in which God ordains that things should happen.

The large view which Berkeley would have us take of "the production of natural things," especially with regard to small points of imperfection, is not an unreasonable one to take. Looked at from this larger standpoint, it must be conceded that there is just ground for claiming that "wisdom and goodness" are the predominant characteristics. The conclusion shows how intent Berkeley was upon the task of showing that a wise study of philosophy only confirms the popular belief in the reality of God, and in the mercy and goodness experienced by mankind at the hands of the Deity. This makes it all the more striking that the arguments used by the good bishop against scepticism should have been put forward as strong proof of the soundness of that very scepticism which it was intended to confute and counteract.

In conclusion, it should be noted that Bishop Berkeley's position as a philosopher is that of a thinker of great originality and power. It is easy to scoff at his denial of the existence of matter as anything other than attributes, but it is quite another and much more difficult thing to demonstrate the weakness of his exposition, and to explain more lucidly and more cogently that which Berkeley set about explaining. And even though we succeed in this arduous task of confutation and explanation, we cannot but admire the zeal and earnestness of the man who was a philosopher because he desired above all things to find "the strongest incentive to virtue and the best guard against vice."

Questions.

1. Berkeley's main interest was "to settle the philosophical meaning of *material substance*." Expound and illustrate this statement. (1893.)

2. "The ideas imprinted on the senses by the Author of nature are called *real things*." Examine this view, and show particularly (1) what assumptions are implied in it, (2) what important consequences flow from it. (1893.)

3. On what grounds did Berkeley maintain "the natural immortality of the soul"? Examine his arguments. (1893.)

4. How does Berkeley conclude that we know of the existence of "other spirits"? Examine his doctrine. (1894.)

5. "We cannot even frame an idea of pure space exclusive of all body." How did Berkeley prove this, and what main conclusions did he draw from this view? (1894.)

6. In what sense does Berkeley deny, and in what sense does he not deny, the reality of the external world? (1897.)

7. What is in our minds when we are proving a proposition about triangles in general? Can we think of a "triangle in general" which is not any particular triangle? How would Berkeley deal with this question? (1897.)

8. Give Berkeley's views about the reality which we ascribe to the external world. (1898.)

9. How does Berkeley seek to prove the existence of God? (1898.)

10. Explain Locke's distinction between primary and secondary qualities of matter. Explain Berkeley's treatment of it. (1898.)

11. Analyse psychologically the judgment, "I see the postman coming along the road," distinguishing clearly between what are strictly facts of sensation and what are inferences, conscious and unconscious. (1898.)

This course of study having now come to an end, it remains for the author to wish all the participators therein complete success in the coming examination. He will be greatly obliged if, when the results are declared, successful students will notify him of their success by post-card. He will also like to hear from any student who, after consistently working through the course, fails to satisfy the examiners. With respect to future plans, it is uncertain whether a course for the L.L.A. will be given during the coming year, unless a very large number of subscribers send in a request for a set of papers to be given. If this should be done, an attempt will be made to satisfy the needs of our readers.

A few hints may be given concerning the examination itself.

Logic.—Great care must be taken in dealing with the exercises in reduction and conversion. The first step must be to express the meaning of the propositions in simple, straightforward language, remembering all the cautions that have from time to time been given under this head: thus, "Few of the men were traitors," means "some were not traitors," and must be dealt with as an **O** proposition, and so on.

In answering questions on the possibility of certain combinations of propositions being found in certain figures of the syllogism, try to deal with the question from the general standpoint, bringing in all the rules of syllogism that can be applied. This is much better than taking the combinations step by step through all the moods and figures.

Be careful to have Mill's canons of induction well learned, and also be clear as to Mill's position as a logician.

Psychology.—The questions that are answered at the end of *Mental Science and Logic* should be very useful now in suggesting how to deal with questions. For the rest, it should be remembered that psychology is common-sense, and therefore mere verbiage without point will be worse than useless. In analysing propositions, the thing of most importance is to clearly distinguish between sensation and inference, and not to mistake one for the other.

Berkeley.—The parts likely to be called for under this head are:—(1) What Berkeley means by the existence of matter; (2) how we come to know ourselves; (3) how the existence of God is proved; (4) primary and secondary qualities of matter; (5) how we know of the existence of other "selves;" (6) the immortality of the soul; (7) abstract ideas; (8) language; (9) the connection between Locke and Berkeley.

LONDON MATRICULATION.

June 1899.

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LATIN.

Course for June.

BEFORE making my final remarks on the June examination, I must offer all who have followed this course my best wishes for success in the coming examination.

As the first paper deals with the prescribed authors only, it is most important to revise thoroughly the difficult passages in the *Pro Marcello* and *In Catilinam* I. The circumstances which gave rise to these orations should be thoroughly known. It will be necessary to know the lives of the important men mentioned in these books. The paper given below, in the *Pro Marcello*, will serve as an indication of the kind of question our readers will have to face. In grammar, I should advise a revision of the notes and sentences given in our course.

Typical Sentences.

40. "This happened on November 22, 54 B.C., when Cicero was consul."

Hoc evenit ante diem nonum Kalendas Decembres (-is) anno urbis conditae septingentesimo consule Cicerone.

Notes.—(*a*) As we saw in last month's course, November in 54 B.C. had only 29 days. Therefore, November 22 is the (29 – 22 + 2) ninth day before the kalends of December. (*b*) The city of Rome was founded 753 B.C. Therefore, 54 B.C. is (753 – 54 + 1) the seven-hundredth year from the foundation of the city. (*c*) Note the use of the ablative absolute, *consule Cicerone*. Short clauses are often neatly expressed in Latin by

the ablative absolute. (*d*) *Urbis conditae* literally means, of the "city founded." It is a characteristic Latin idiom to use a past participle and a noun where in English we use two nouns (compare Milton's *Paradise Lost*, which is equivalent to "The Losing of Paradise," *Paradise Regained*, etc.).

41. "Balbus ordered his soldiers not to attack the enemy until he gave the word of command."

Balbus militibus suis imperavit ne in hostes impetum facerent prinsquam (antequam) signum daret.

Notes.—(*a*) Verbs of ordering, as we have seen before, take generally the dative and *ut* and subjunctive. *Iubeo* and *veto*, however, take the accusative and infinitive. (*b*) *Daret* is in subjunctive, because the sentence is in *oratio obliqua*. It forms part of what Balbus said. (See last month's course.)

42. "It is said that he stopped in Rome from March 10 to July 14 without going to see his uncle."

Romae ab ante diem sextum Idus Martias usque ad pridie Idus Iulias mansisse nec patruum visum isse dicitur.

Notes.—(*a*) *A. d. vi. Id*..... is regarded as a stereotyped noun, and prepositions are used before it. The same remark applies to *pridie Idus Iulias*. (*b*) "Without" and a verbal noun are expressed (see previous sentences) by *nec*, and the same mood and tense as in the preceding clause, if the preceding clause is a positive one. (*c*) *Visum* is the supine in *-um*, used to express purpose after a verb of *motion*. (*d*) *Dicitur* is used personally—literally, "he is said to have remained." With *dicitur* and *videtur*, as we have mentioned before, the Latins avoided the impersonal construction.

43. "It is well known that he could have played well on the lyre, if he had not been prevented by his father."

Constat eum fidibus bene ludere potuisse si a patre non esset prohibitus.

Notes.—(*a*) Note the phrase for "it is well known that." *Constat* is not followed by *ut* and the subjunctive, but by the accusative and infinitive. (*b*) "Could have" and an infinitive are expressed by the perfect tense of *possum* and the *present* infinitive. Be careful not to use the perfect infinitive after verbs like *possum*, *debeo*, and *oportet*. We have explained the reason why in our first sets of typical sentences, but the mistake is such a common one that students require repeated warnings. (*c*) *Fidibus* is the ablative. (*d*) The subjunctive, *prohibitus esset*, is used because the past tense of *possum*, which forms the apodosis, is equivalent to a subjunctive. By the well-known rule already stated, the subjunctive is used in the protasis or "if" clause, if the subjunctive or its equivalent is used in the principal clause. Here *potuisse*, though in the infinitive, is equivalent to a subjunctive, as the infinitive is used because *constat* requires one. (*e*) Once more a note of warning with regard to the preposition "by." If it is used with the agent, use *a* or *ab* with the ablative in Latin. If it is used with the instrument, use in Latin the simple ablative without any preposition. If, however, "by" and the agent are used with the gerundive, the dative is used in Latin.

44. "He is afraid that he has been rather foolish in trusting in Balbus' treacherous wife."

Timet ne stultior sit qui Balbi mulieri perfidae confisus sit.

Notes.—(*a*) Note again the construction required by verbs of fearing. (*b*) The comparative often expresses that a person possesses a quality in *too high* a degree—as, *senectus loquacior est*, "old age is too talkative." In this sentence we translate "rather foolish" by *stultior*. (*c*) "In trusting" = "since he trusted." This is neatly turned by *qui* and the subjunctive (*qui* = *cum is*): the subjunctive normally follows *qui* used in a causal sense. (*d*) *Confido* usually followed by dative of the person in whom confidence is placed.

45. "Would that your friend had shuffled off this mortal coil before he had given way to anger and plundered the city."

Utinam amicus tuus e vita excessisset antequam irae indulsisset et urbem spoliavisset.

Notes.—(*a*) An impossible wish is expressed by *utinam* and the pluperfect subjunctive. (*b*) "Shuffled off this mortal coil" must not be translated literally. It merely means "to die;" therefore use the ordinary verb which expressed "dying"—that is, *e vita excedere*. Candidates must be very cautious in handling metaphors. We have an enormous stock of metaphors, many of which are used quite unconsciously—for example, the one mentioned by Dean Bradley in his *Latin Prose*, "He ascended the throne." A literal translation of this would bring before the mind of the matter-of-fact Roman a picture of a man climbing up the throne. Consequently this should be expressed in Latin by *rex factus est*. Of course, there are certain metaphors which are common to both English and Latin. The Latins, however, when they used metaphors, generally apologised for them by using words like *velut*, "as if;" *ut ita dicam*, "so to say."

46. "I shall not answer till you are silent."

Non respondebo donec taceas (*tacueris*).

Notes.—The subjunctive can be used here with *donec*, as there is a notion of purpose or result; or you can use the future perfect indicative, *not* the present indicative. "You are silent" is equivalent to, "you shall have been silent."

47. "Balbus is not the kind of man to spare the foolish Dolabella."

Balbus non is est qui Dolabellae homini stulto parcat.

Notes.—(*a*) Note that *is*.....*qui* with subjunctive expresses "just the man to;" *is*.....*qui parcit* means, "is the *man who spares*." (*b*) *Qui* in the sentence above = "such as who;" the subjunctive is *generic* or *descriptive*.

48. "When Hannibal fell severely wounded by a javelin in the thigh, the panic that seized his soldiers was so great that the town was all but abandoned."

Cum Hannibal femore pilo graviter vulnerato cecidisset tantus terror quis milites invasit ut haud multum abesset quin oppidum desereretur.

Notes.—(*a*) *Cum* with a past tense, if "since" or "although" can be substituted for it, requires in Latin the subjunctive; hence *cecidisset*. (*b*) "All but" is generally translated by *haud multum abesse quin*—literally, "it was not far absent but that." (*c*) *Ut*, meaning "so that," requires the subjunctive. (*d*) *Femore vulnerato*, ablative absolute. (*e*) *Pilo*, ablative of instrument.

Pro Marcello, chaps. i. to v. (inclusive).

1. Translate—(*a*) § 3, Intellectum est enim.....anteferre; (*b*) § 5, Soleo saepe.....alia maiora; (*c*) § 10, Te vero.....sedibus; (*d*) § 14, Hominem sum.....periculo sensi.

2. State the historical circumstances of the *Pro Marcello*. Give the date of the speech, and refer to the doubts cast on the authenticity of the speech.

3. Sketch the life of M. Marcellus, pointing out his influence on the times.

4. Sketch the career of Cæsar from 50 B.C. to 46 B.C.

5. Write notes (grammatical or historical) on the following passages. Translation is to be given in each case:—

(*a*) Nec fas esse ducebam versari me in nostro *vetere curriculo* illo *aemulo* atque imitatore studiorum ac laborum meorum quasi quodam socio a me distracto.
(*b*) Ex quo intelligis quanta in dato beneficio laus *sit*.
(*c*) Quis est artium *studio* praestantior.
(*d*) Nullius tantum flumen est ingenii quod enarrare res tuas gestas *possit*.
(*e*) *Hodierno* die consecutus.
(*f*) Domuisti gentes immanitate barbaras (name the *gentes*).
(*g*) Nulla est tanta vis quae non ferro debilitari *possit*.
(*h*) *Victoriam* temperare.
(*i*) Eius modi res *nescio quo modo obstrepi* clamore militum videntur.
(*j*) Gratias agunt quod *brevi* tempore *futura sit illa* auctoritas in his maiorum suorum et suis sedibus.
(*k*) Omnium Marcellorum meum pectus memoria obfudit.
(*l*) Hunc diem tuis maximis *gratulationibus* iure antepones (mention the *gratulationes*).
(*m*) Nihil est factum quod non *consumat* vetustas.
(*n*) Ceteros victores bellorum civilium *aequitate* viceras (mention some).
(*o*) Iudicium quam late *pateat* adtendite.

6. Give the meaning of—*signum sustulisti; cum*.....*tum; profecto; pace tua; commeatus; vindicare; turma; quin etiam; medius fidius; curia; gestio; gratulatio.*

7. Sketch the relations between Cicero and Cæsar from 50 B.C. to Cæsar's death.

8. Give an account of the war between Cæsar and the Pompeians. Dates should be given.

9. What triumphs did Cæsar celebrate? Explain the technical meaning of the term *triumphus*.

10. Mention the chief measures of the dictator Cæsar.

Pro Marcello, chap. vi. to end.

1. Translate—(*a*) § 18; (*b*) § 20, Noli igitur.....senserunt; (*c*) § 22, Equidem de te.....credamus; (*d*) § 24, Non fuit.....prohibuisset; (*e*) § 25, Hic tu.....meritorum; (*f*) § 30, Diversae.....duces; (*g*) § 34, Itaque.....accesserit.

2. Write notes (grammatical or historical) on:—

(*a*) Gladius vagina vacuus.
(*b*) *Quidam* otiosis minabantur nec quid quisque *sensisset* sed ubi *fuisset* cogitandum esse dicebant.
(*c*) *Felicitate* tuae gratulabere.
(*d*) Tanta in magnitudine animi et consilii dignitas ut haec a *virtute* donata cetera a *fortuna* commodata esse *videantur*.
(*e*) Ex hoc *numero qui* una tecum *fuerunt*.

(*f*) Sed cum tantae latebrae *sint*, *augeamus* sane suspicionem tuam.
(*g*) Nam quis est omnium tam ignarus rerum, qui non *intellegat* tua salute contineri suam et ex *unius* tua vita pendere omnium.
(*h*) Quem deum si cupiat posse opitulari *reipublicae credamus*.
(*i*) Quae volnera tibi sananda sunt *quibus* praeter te nemo mederi potest.
(*j*) Vide ne tua virtus *admirationis* plus *sit* habitura quam gloriae.
(*k*) *Huic* tu *insertias* oportet.
(*l*) Multa habet quae *mixtetur*.
(*m*) Obstupescent posteri *imperia*, *provincias*, *Rhenum*, *Oceanam hilum* (explain allusions carefully, with dates).
(*n*) Haud scio an.
(*o*) *Armis* et *castris* dissidebamus.
(*p*) Multo dubitabant quid optimum *esset*.
(*q*) Perfuncta respublica hoc misero *bello* (mention the chief incidents in the war).

3. Give the meaning of—*dumtaxat*; *opitulari*; *suboles*; *togatus*; *immo vero*; *maximus cumulus accessit cupiditas*; *nimirum*; *sceleris insidiarumque consensio accedit*; *expedit*.

4. Distinguish between *ita*.....*ut* and *ut*.....*ita*; *cum*.....*tum* and *tum*.....*cum*; *non nulli* and *nulli non*; *vereor ut* and *vereor ne*; *pars* and *partes*; *excubiae* and *custodiae*.

MATHEMATICS.

GEOMETRY COURSE.

Revise the book work of all the first four books, so as to know the propositions thoroughly. Work a paper, so as to see how much you can write in the three hours. The propositions set on the paper should be done first, and the riders tried in the time left.

Solutions to last month's riders:—

1. Let AB be given base. On AB describe a segment of a circle, ABC, containing an angle equal to the given angle; complete the circle of which it is a segment. Bisect that segment of the circle which does not contain the given angle in D so that arc AD = arc BD. Join D to E, the given point in AB, and produce to cut the circle in C. Then ABC is the required triangle.

2. Let AB be given base. On AB describe a segment, ACB, of a circle containing an angle equal to the given vertical angle. Bisect AB in O, and draw OC perpendicular to AB, cutting circle in C. Then ABC will be a triangle of greatest area; for if P be any other point on the circle, APB will be a triangle of same base and vertical angle, but will be of clearly less area, since its altitude, PN (PN being perpendicular from P on AB), is less than the altitude, CO, of triangle ABC.

3. Using the figure of II. 14 as given in Hall and Stevens,

$$BE^2 + ED^2 = 2GE^2 + 2GF^2.$$
$$\therefore BE^2 + ED^2 > 2GF^2;$$
that is, $> 2GH^2$.
$$\therefore BE^2 + ED^2 > 2HE^2,$$

since HE is less than GH.

But square on EH = rectangle BE.ED,
and square on diagonal of $EH^2 = 2HE^2$,
and square on diagonal of rectangle BE.ED = $BE^2 + ED^2$.
Hence the required result.

4. Join EA.
Then ∠ PEA is a right angle (III. 31).
∴ ∠ DEA is also a right angle,
and ∠ DBA is a right angle (constr.).
∴ DE.AB is a quadrilateral capable of being inscribed in a circle (III. 22, converse).
∴ rectangle PE.PD = rectangle PA.PB = constant (III. 35).

In writing out propositions in the examination, reference should be given, if known, by referring to the number and book of the proposition used; also such abbreviations as AB^2 for the square on AB, + (plus), − (minus), should *be avoided*.

ARITHMETIC COURSE.

Revise those portions of the subject in which you feel yourself to be weak. Decimals, approximations, and stocks should be thoroughly known.

Solutions to last month's examples:—

1. $\frac{1}{\sqrt{7}} = \frac{\sqrt{7}}{\sqrt{7}\times\sqrt{7}} = \frac{\sqrt{7}}{7} = .3779.$

2. $\frac{1}{\sqrt{10}-3} = \frac{\sqrt{10}+3}{(\sqrt{10}-3)(\sqrt{10}+3)} = \frac{\sqrt{10}+3}{10-9}$
$= \sqrt{10}+3 = 6{\cdot}1622.$

3. 7 lbs. of the mixture cost him (6 + 12)s., or 18s.
Gaining 5 per cent. means—
What cost 100 he sells for 105.
∴ what cost 18s. he sells for $\frac{105\times 18}{100}$s., or 18·9s.;
that is, 7 lbs. are sold for 18·9s.
∴ 1 lb. is sold for 2·7s.
= 2s. 8·4d.
= 2s. 8½d. approx.

4. Let us suppose an article marked for sale at 100s.
∴ its actual cost is 56 per cent. of this—that is, 56s.;
and it sold at a discount of 12½ per cent.—that is, for 87½s.
∴ what costs 56s. is sold for 87½s.
∴ what costs 100 is sold for $\frac{175\times 100}{2\times 56} = \frac{17500}{112} = 106{\cdot}25$,
showing a gain of 6¼ per cent.

ALGEBRA COURSE.

A general revision of the subject, with special attention to factors and the progressions.

Learn up the formulæ for progressions.

$l = a + (n-1)d$ $\qquad$ $l = ar^{n-1}$

$s = \frac{n}{2}(a+l)$ $\qquad$ $s = \frac{a(1-r^n)}{1-r}$

$s = \frac{n}{2}\{2a + \overline{n-1}d\}$ $\qquad$ Sum to infinity $= \frac{a}{1-r}$.

Note also—
$a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2+b^2+c^2-ab-ac-bc)$.
$a^4 + a^2b^2 + b^4 = (a^2+b^2)^2 - a^2b^2 = (a^2+ab+b^2)(a^2-ab+b^2)$.
$a^4 + 64 = (a^2+8)^2 - 16a^2 = (a^2+4a+8)(a^2-4a+8)$.

1.
$(x-3a)^3 + (2x+5a)^3 - (3x+2a)^3 + 3(x-3a)(2x+5a)(3x+2a)$
$= (x-3a)^3 + (2x+5a)^3 - (3x+2a)^3 - 3(x-3a)(2x+5a)(2a+3x)$
$= [(x-3a) + (2x+5a) - (3x+2a)]\,[(x-3a)^2 + \ldots.]$
$= (0)(\ldots.)$
$= 0,$
from which the required result follows.

Remember the formula
$a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2+b^2+c^2-ab-ac-bc)$.
Note also— $(a-b)^3 = -(b-a)^3$,
but $(a-b)^2 = (b-a)^2$.

2.
$1 + y(1+x)^2(1+xy) = x(1+x)^2y^2 + (1+x)^2y + 1$
$= [x(1+x)y + 1]\,[(1+x)y + 1]$ by trial.

Note we arrange the expression in descending powers of y, and we factorise by trial; for example—
$3y + 1 + 2y^2 = 2y^2 + 3y + 1 = (2y+1)(y+1)$.

3. Let n = number of years required.
So that 20 + 30 + 40 + ... to n terms = 10000.
$\therefore \frac{n}{2}\{40 + 10(n-1)\} = 10000.$
$n(30 + 10n) = 20000.$
$\therefore n^2 + 3n - 2000 = 0.$
$\therefore n = \frac{-3 \pm \sqrt{9 + 8000}}{2} = \frac{-3 \pm 89{\cdot}5\ldots}{2} = \frac{86{\cdot}5\ldots}{2}$ and a minus inadmissible answer
Ans. 43·25 years.
So that the savings will exceed the 10000 in 44 years.

4. $100^2 - 99^2 = (100-99)(100+99) = 1(100+99) = 100+99.$
Similarly, $98^2 - 97^2 = 98 + 97,$
$2^2 - 1 = 2 + 1.$
∴ the series = 100 + 99 + 98 + 97 + ... + 2 + 1
$= \frac{100}{2}(100+1)$
$= 5050.$

5. $1 - {\cdot}1 + {\cdot}01 - {\cdot}001 + \ldots.$ is a G.P. whose common factor = $-{\cdot}1 \div 1 = -{\cdot}1$.
$\therefore$ sum to infinity $= \frac{a}{1-r} = \frac{1}{1-(-{\cdot}1)} = \frac{1}{1{\cdot}1} = \frac{10}{11}.$

GENERAL ELEMENTARY SCIENCE.

A revision of the subject, with special attention to the chemistry and mechanics.

OUR PUPIL TEACHERS' AND SCHOLARSHIP COURSE.

BY ARTHUR T. FLUX,

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SPRING EXAMINATION, 1900.

Third Month—June.

1. READING AND RECITATION.

REGULAR oral practice must be taken in Reading, and the Recitation should be learned early in the year. It would be a good and useful mental exercise to commit to memory all the poems set, or, at any rate, such parts of them as are particularly interesting. Messrs. Blackie and Son publish *The Talisman* in their "School and Home Library," and Messrs. Macmillan and Co.'s editions of the *Life of Nelson*, the *Essay on Frederick the Great*, and the *New Atlantis* will be found most useful.

2. ENGLISH.

Candidates.—Marmion, Canto vi., lines 130 to 230.

First Year.—The Traveller, lines 51 to 98, with 20 roots and meanings per week.

Second Year.—Julius Cæsar, from Act i., Scene 2 ("I will do so; but look you, Cassius"), to the end of Act i.

Notes.—(*a*) "MARMION."

Parsing and Analysis.

Line 131. *Makes.* Notice the peculiar meaning in this case = does.
What. Interrogative Pronoun.
132. *For.* Illative Conjunction.
134. *The breastplate pierced.* May be taken as Nom. Absolute clause.
Much. Adv. of Degree.
135. This line is a Noun Sentence, gov. by *fear*.
137. *As.* Relative Pronoun. Object of *say*.
138. Read "*Thus it happened to Wilton.*"
139. Read "Not truth as pure and hard—as—diamond (is pure and hard)."
As. Adv. Conjunction.—*Diamond.* Nominative to *is* understood.
143. *Himself.* Emphatic Pronoun.
144. *Ghost.* Nominative after *seemed*, a Verb of incomplete predication.
145. This line is an Adverbial Sentence of Reason.
148. *Dames* and *Lords.* Nominatives of Address.
149. Noun Sentence, gov. by *expect*.
151. Object of *would choose*.
152. *Unless.* Conjunction Adverbial.—*It.* Impersonal Pronoun.
To dip. In apposition with *it*.
154. Far. Adv. of Degree, mod. *less*.
Less. Adv. of Degree, mod. *can declare*.
156. *Brightening.* Imp. Part. qual. *Sorrow, Surprise, Pity, Joy*, and *Hope*, all of which are Subject and Nominatives to *displayed*.
161 and 162. These lines are an enlargement of the proper nouns above.
163. *Fatigued.* Perf. Part. qual. *all*.
165. *What he then said.* Noun Sentence.—*What.* Objective Case, gov. by *said*.
169. *Forget we.* Imperative Mood.
171. *Thence dragged.* Enlargement of *me* in line 173.
173. *Me* = myself. Reflexive Pronoun. Compare "I sat me down."
175. *Austin.* In apposition with *he*, line 181.
179. *Menials, friends, kinsmen.* Nominatives Absolute.
181. *Only* = alone (Lat. *solus*). Adj. lim. *he*.
184. *Far.* Adv. of Degree, mod. *more*.
185. *To wake despair.* Infinitive of *purpose*.
187. *Me* = myself. Reflexive Pronoun.
189. *At length.* Adverbial Phrase, mod. *left*.
Brought and *wrought.* Perf. Part. qual. *I*, line 191.
192. *Arrayed in a Palmer's weeds to shade my name and form.* Enlargement of *I*.
195. *Lord.* In apposition with *I*, line 194.
207. *Even.* Adv. of Emphasis, mod. *then*.
208. Read *should spare*.
209. *As.* Conjunction ("As a second Cain would be restless").
211. *Full.* Adv. of Degree, mod. *well*, Adv. of Manner.
213 and 214. Noun Sentences in apposition with *sound*.
220. *Me.* Reflexive Pronoun.
222. Noun Sentence, gov. by *did provide*.
230. *What were his thoughts.* Noun Sentence, gov. by *cannot tell*.

Meanings.

150. A painter might as well try to paint the rainbow as I to depict the scene which followed.
170. Referring to the combat with Marmion.
179. *Menials*—that is, servants.

(*b*) "THE TRAVELLER."

General Paraphrase (continued).

Line 5. As a miser, fond of visiting his wealth and counting it over and over again, is delighted to find that there is so much accumulated, yet discontented that there is not more, so I, pondering over the happiness and blessings provided by Heaven, still regret that the amount of human bliss is no larger. I have sought, amidst the many scenes through which I have passed, to find some place where unalloyed happiness existed, so that I might there settle and derive my own delight from seeing others perfectly blest.

Line 63. But where is such a place, when every country claims to possess it? The Eskimo, in the eternal winter of snow and ice, lays claim to it; and the Negro, under the blaze of a tropical sun, living a life of indolence and sensuality, points to the sunny seas and fruitful land as evidence that it is his. And this is the case in every country: the inhabitant of it, imbued with a patriotic love and admiration for it, considers it superior to all others. But if we make allowance for this natural bias, and examine impartially the conditions of life in each part, we shall probably come to the conclusion that, all things considered, a man may attain the highest possible happiness in any country, for each possesses natural advantages which are counterbalanced by drawbacks.

Line 81. The blessings derived direct from nature are everywhere the same. As a reward for industry and toil, daily food is obtainable, in a rocky country as in a fertile plain; and even in a mountainous district, custom endears an existence which at first sight appears unattractive.

The blessings supplied by the agency of man—such things as wealth, trade, contentment, a high standard of honour, and liberty—vary considerably in different parts, for it seems impossible for all of them to exist side by side.

In a land where there are ample liberty and abundance of wealth, contentment is rarely found; where the people are keen and progressive in matters of commerce, a fine sense of honour is usually absent. And so every country singles out one particular form of happiness, and all its ideas and laws are directed to the furtherance of that particular blessing to the exclusion and scorn of all others, till the very devotion paid to it leads to inconvenience, and defeats the objects in view by giving rise to some special form of unhappiness.

Notes on Parsing and Analysis.

Line 51. *some.* Demonstrative in this case. Note the different meanings of this word. Some apples = a certain *number* of apples. *Some* bread = a certain *quantity* of bread. Some man = one particular man.
54. *Yet, etc.* Adversative to preceding sentence.
For, etc. Adv. of Reason to *sighs*.
56. *Pleased with each good.* Participial Phrase, attrib. to *my*, line 55.
58. *To see.* Infinitive of Reason.
59. *To find....consigned.* Direct Object of *wish*.
61. Adjectival Sentence to *spot*.
Hope. Nom. Absolute.
63. *Where to find....below.* Direct Object of *can direct*.
Below. Adj. qual. *spot*.
64. *To know.* Object of *pretend*.
72. *Good.* Abs. Noun. Read "*which* they gave."
73. *Such.* Adj. qual. *boast*.
Where'er. Adv. Conjunction.
75. *And yet.* Belongs to *still shall wisdom, etc.*
77. *Though.* Concessive Conjunction.
79. *Given by Art or Nature to different nations.* Enlargement of *good*.
80. *Even.* Adj. qual. *blessings*, Adj. Complement of the Predicate.
81. *Alike.* Adv. mod. *kind*.
87. Read *The blessings, sent, are more various.*
88. Nouns in this line in apposition with *blessings* in preceding line.
89. *Each other's.* Reciprocal Pronoun.
90. *Destructive.* Adj. Complement of *seems*.
93. *Hence.* Adv. of Reason, mod. *conforms and models*.
Prone. Adj. qual. *state*.
96. *Aims at.* Prepositional Verb.—*Ends.* Direct Object.

(*c*) "JULIUS CÆSAR."

Act i., Scene 2.

218. *Sad.* Adj. Comp. of *looks*, NOT Adverb.
223. *A-shouting. A* = *on*, Preposition gov. the Gerund *shouting*.
228. *Marry*—that is, by the Virgin Mary; compare Zounds = by God's wounds, etc.
241. *Loth to lay. Loth* = an Adj. qual. *he; to lay*, Infin. limiting *loth*.
248. *Opening.* Gerund, gov. by *of*. *Receiving*, Gerund, gov. by (*of*).
250. *What.* An Exclamation, *not* part of a sentence.
255. *We have the falling sickness.* Note Cassius' meaning: "*We* are the men who are always ready to fall down instead of standing up to assert our rights." Casca does not, or will not, see this meaning of the remark.
263. *He plucked* me *ope, etc. Me:* this is a case of the Ethical Dative or Dative of Advantage. Compare "Knock me at the gate" "Saddle me the ass."
264. *An* = if. Conjunction. Hypothetical.
266. *A man of any occupation*—that is, a mechanic, and not a noble; or, more probably, "If I had had the sense to seize the opportunity."
282. *For pulling, etc.* Another case of Gerund.
293. "How obtuse and abrupt Casca has become. He used to be intelligent and quick as a boy.—So he is now if he is engaged in any matter of importance. His bluntness is merely assumed to make men take his biting words, as a man takes a piquant sauce with his dinner."
306, etc. "Brutus is so honourable that he cannot suspect any deception in others, and men of his stamp should associate only with those of similar ideas, for if they come into contact with men of the world they are easily deceived."
312. *If I were Brutus, etc.* The meaning is obscure: it may be, "If I were Brutus, and Brutus were Cassius;" or, "If I were Brutus, and Cæsar were Cassius." The first reading would mean that Cassius would not be influenced against Cæsar by Brutus; the second, that if Cassius were such a friend of Cæsar as Brutus was, no one should sway his allegiance.
319. Read *Let Cæsar to seat him sure* = himself surely. *Him*, Reflexive Pronoun.

Scene 3.

Line 4. *Shakes like a thing unfirm* (shakes).
10. Different readings. *Tempest dropping fire. Fire* being the Noun, or tempest, dropping fire; *fire* being governed by *dropping*.
14. *More wonderful*—that is, more wonderful than usual; or, more wonderful than what we have all seen.
22. *Annoying.* Gerund, gov. by *without*.
25. *All in fire. All* = Adv. mod. the phrase *in fire*.
27. *Even.* Adv. mod. *at noonday*.
31 and 32. "For it is my opinion they predict some great calamity which is to fall on the country where they appear."
35. *Clean.* Adv. mod. *from the purpose*.
47. *Me* = myself. Reflexive Pronoun.
54. *To fear and tremble.* In apposition with *it*.
82. *Woe the while* = Woe (be to) the time. *While* is a Dat.
84. *Womanish.* Adj. Completion of Predicate.
88. *Save* = except. Prep. gov. the phrase *here in Italy*.

90. This speech of Cassius expresses the same ideas as the well-known lyric, "Stone walls do not a prison make, nor iron bars a cage," with an addition of the Stoic philosophy that a man should always escape from unpleasant surroundings by taking his life.
106. *Were.* Note the use of the Subjunctive Mood here.
112. A very neat way of broaching the subject to Casca, who had either to express sympathy with Cassius or confess himself "a willing bondman."
114. *I am armed*—that is, fully prepared: no reference to weapons.
116. *Hold, my hand*—that is, Hold (or stop), I give you my hand.
118. *I will set this foot of mine as far [as he sets his foot] who goes farthest.*
136. *I am glad on't.* Not in answer to Casca's question, but in reference to his remark that "Casca is incorporate to our attempts."
146. *All this done.* Nom. Absolute phrase; as also *That done*, line 152.
156. *Yields him ours* = Yields himself to be ours.
157. "He is held in the highest respect by the people, and what would appear in us to be treachery and base plotting will be looked upon, if we have his support, as high-minded and disinterested patriotism."
162. *Right well conceited* = Conceived or understood.

(*N. B.*—Students are cordially invited to write for assistance in any difficulty not explained in the notes.)

Essay Writing.

Bear in mind the remarks made on this subject last month. Send up an essay each month for criticism.

Subjects for this month:—1. Money; 2. A Steamship; 3. Insects and their uses; 4. Good Manners; 5. Children's Games; 6. Printing.

3. History.

Candidates.—For this month prepare the *Norman Kings.*

Note carefully the changes involved by the Conquest, and obtain a clear idea of the Feudal System and its working. Henry the First's Charter, the Investiture Dispute, and the Civil War between Stephen and Matilda, must also be thoroughly prepared. Enter in notebooks and learn brief lives of Lanfranc, Anselm, Hereward, Robert of Normandy, and Flambard.

First Year.—William the First to Stephen.

Chief Points.—William the First. The completion of the Conquest. Rising in 1069. The Feudal System. Church Reform. The revolts of the Barons. Domesday Book. Salisbury Decree. Effects of the Conquest.

William the Second.—Flambard and his oppressions. The War in Normandy.

Henry the First.—Establishment on the Throne. War in Normandy. Great Charter. Investiture Dispute.

Stephen.—Right to the Throne. Civil War. State of England. Adulterine Castles. Treaty of Wallingford.

Notes on the Norman Conquest.

Completion of the Conquest. When the battle of Hastings was fought and won, on October 14, 1066, William had by no means conquered England. Had there been a capable leader who could have united the various factions, and who could have drawn together the fighting strength of the Saxons, William would have found the task before him wellnigh impossible. By the divided counsels, jealousies, and intrigues amongst the Saxons, the way was made comparatively easy. As soon as the news of the defeat reached London, a hastily-summoned gemote elected Edgar Atheling, a weak-minded boy, as king. The earls Edwin and Morcar withdrew their forces from London.

On October 20, William took Romney, and the following day Dover was occupied and accidentally burnt; for which William paid compensation. Nine days later Canterbury was taken, and, owing to the illness of William, the advance was delayed till late in the month. At the beginning of December, William was in Southwark, south of the river, and had to march to Wallingford before he effected a crossing. Doubling back to Berkhampstead in Hertfordshire, he awaited a deputation of the Atheling and archbishop, with others, who invited him to assume the crown; and on December 25 he was crowned at Westminster. Thus William assumed the crown, not as a conqueror, but as a properly-elected king—a point to be carefully noted.

1067. Returning in the spring to Normandy, William left the government to Odo, Bishop of Bayeux, and William FitzOsbern, whose oppressive rule and harsh treatment soon created a blaze of revolt—the west Saxons uniting with the Welsh, and the north and north-west under Edwin and Morcar. In December, William returned, and by February 1068 had stamped out the rebellion in the west and taken Exeter. During the summer and autumn the centre and north of England were for the first time reduced.

1069. In the autumn of 1069 the north was again in rebellion, animated by the expectation of assistance from the Danes. Hitherto William had treated the Saxons with consideration; but now his fury broke forth, and buying off the Danes, he harried and wasted the six northern counties till there were practically no people left. York and Chester bore the brunt of the fury. In 1070 the submission of Waltheof ended the last native rebellion. The conquest had meant the death of 100,000 Saxons.

The same year Hereward the Wake was driven from his camp of refuge at Ely, and became an outlaw in the Bruneswald. The student should read Kingsley's brilliant historical novel, *Hereward the Wake*, for further details.

As the conquest proceeded, strong castles were erected at important points, each of which was a link in the chain which bound down the native spirit.

The Settlement. The confiscations following the various risings had placed most of the estates in William's hands, and these were bestowed upon his followers, care being taken that no one baron should hold all his lands in one part. Not less difficult perhaps than the conquest of the English was William's reducing of his own barons. Ignorant, brutal, avaricious, of low birth in many cases, they looked upon themselves rather as colleagues of William than his vassals. England was to them a country to be spoiled, and it needed all William's authority and statecraft to keep them in check and make them recognise their true position. That he succeeded as well as he did is no small tribute to his ability. The Saxons were, in nearly all cases, dispossessed of land; the Feudal System was perfected—it *had* existed to some extent before, but now all land was held on a military tenure; the great earldoms were discontinued; William endeavoured to secure a just and firm government—just to all, and firm without being oppressive.

Revolts of the Barons:—
1075. Roger, Earl of Hereford, and Ralph, Earl of Norfolk, rebelled; *object*, to restore the old earldoms. Waltheof implicated, and executed.
1077. Revolt of Robert of Normandy.
1082. Odo of Bayeux, Earl of Kent, arrested for pride and oppression.

The Church. The church under the Anglo-Saxon *regime* had been a national church rather than a branch of the Roman Church. The clergy were ignorant and dissolute; the rules under which they worked were lax, and were not rigidly enforced. Under Lanfranc and William a strenuous and commendable effort was made to raise the whole of the tone and discipline of the clergy. Lanfranc was made archbishop in place of Stigand, and the Saxon bishops and abbots were replaced by foreigners of great learning. Separate ecclesiastical courts were established for the consideration of offences against clerical laws, and under the protection of a reformed church those stately cathedrals and churches, which are to be found all over the land, began to rise. Yet William was too far-sighted a politician to place the church directly under the rule of the Pope. He claimed supremacy; excommunication could only be carried out by his permission, nor were Papal letters to be obtained without his consent.

The Feudal System. This topic is dealt with in all text-books, and it is unnecessary to traverse the same ground. The student *must* get a clear idea of its working, and the various feudal incidents, upon which the revenue of the monarch to a great extent depended.

The *Salisbury Decree* (passed at a great gemote at Salisbury), by which every man was the king's man in precedence to all other claims, is very important.

The *Great Survey*, entered in the Domesday Book, was a statesmanlike means of providing for a proper incidence of taxation.

Changes produced by the Conquest:—
1. A new dynasty of kings introduced.
2. England was brought more into connection with the continent—to its great gain.
3. The power of the church was strengthened.
4. A foreign nobility and prelacy introduced.
5. The Saxons on the whole became serfs.
6. A mixture of races ensued. The dull-witted, phlegmatic, conservative Saxon was improved by the infusion of the brighter, more highly educated, more abstemious Norman.
7. A strife of languages—Norman-French in the courts and by the nobility, Anglo-Saxon in the homes of the people. The strife continued till about 1300, when the Norman-French and Anglo-Saxon blended to form English.
8. The perfection of the Feudal System.
9. Increase of royal power.
10. The substitution of the Great Council (*Magnum Concilium*) for the Witanagemote.
11. Introduction of many new departures in land tenure, etc. (especially Forest Laws).
12. Increased learning, better architecture, improved manners and customs.

Second Year.—Charles the First.

Chief Points.—First three Parliaments. Buckingham. Petition of Right. Period of Absolute Rule, 1629–1638. Money raised by fines—for not receiving knighthood, for encroachments on forest land, for cottages built on less than four acres of land, for gentry who resided in London instead of on their estates. City of London fined £100,000 for extension beyond limits. Fines by Star Chamber. Selling Patents of Monopoly. Loans and Benevolences. Ship Money. Hampden's Trial. Wentworth in Ireland. Laud and the Church. Attempt to introduce Prelacy into Scotland, and results. Short Parliament. Long Parliament and Civil War. This reign will require particular study, especially with regard to the constitutional questions involved.

4. Geography.

Candidates.—England: Physical features—coast, rivers, mountains and hills, lakes, plains.

First Year.—France, Spain, and Portugal.

Second Year.—Finish Africa, with exception of the British possessions. Use maps freely and continually.

5. Arithmetic.

Candidates.—Compound practice.

First Year.—Application of fractions to money, weights, and measures; decimals; reduction of fractions to decimals; addition, subtraction, multiplication, and division.

(Note the question repeatedly set: which vulgar fractions can be represented by finite decimals, and why?)

Second Year.—Compound proportion.

6. Euclid and Algebra.

First Year.—Euclid, Props. 1–4.

Algebra—Use of brackets; addition.

Second Year.—Props. 30–34, with four deductions per week.

Algebra—L.C.M.

7. Music.

Candidates.—Standard scale of pitch. Mental effects, and their modifications.

First Year.—Bridge notes. Six and nine pulse measures.

Second Year.—The intervals of the minor scale.

8. Teaching.

All Years.—Practise the capital letters on the blackboard. Use a good copy (see rules, etc., in *Practical Teacher Copy Book*).

Test Questions.

1. Penmanship.
   Large Hand:—*Alphabetically.*
   Small Hand:—*A man's a man for a' that.*

2. *Candidates.*—Analyse and parse words in italics :—

Once walking thus, at evening tide,
It chanced a gliding sail she spied,
And *sighing*, thought, The abbess *there*
Perchance does to her home repair.

First Year.—Paraphrase and analyse, and parse words in italics :—

But *me*, not destined such delights *to share*,
My prime of life in wandering spent and care,
Impelled, with steps unceasing, *to pursue*
Some fleeting *good* that mocks me with the view
That, *like* the *circle* bounding earth and skies,
Allures from far, *yet*, as I follow, flies,
My fortune leads to traverse realms alone,
And find *no* spot of all the world my *own*.

Second Year.—Paraphrase and analyse—

And it is very much lamented of Brutus

. . . . . .

Have wished that noble Brutus had his eyes.

And parse—*very, as, where, many, speaking, have wished.*

3. *Candidates.*—What right had Alfred to the title of Great? *Or*, Give an account of the work of Dunstan.

First Year.—What do you know of the Danish invasions? *Or*, In what way was the Norman Conquest made easy by preceding events?

Second Year.—Say what you can of the Puritans and their opposition to James the First.

4. *Candidates.*—Of what countries is South America comprised? Give the capitals of each.

First Year.—Say what you can of the various races of people in Europe.

Second Year.—Give some account of the present state of Egypt. How has the British occupation affected it?

5. Give rules which you would observe in correcting dictation exercises of children.

AUTUMN EXAMINATION, 1899.

Ninth Month—June.

WORK TO BE PREPARED.

A.—ENGLISH.

First Year.—Ode on Spring, verse 5.

Second Year.—Prepare fully lines 341–384 of *The Deserted Village.*

Third Year.—1. Learn twenty roots and meanings each week.

2. Prepare lines 327–360 of Pope's *Essay on Man*, Epis. IV.

(For Full Notes on Paraphrasing, Parsing, and Analysis, see January Number.)

B.—ARITHMETIC.

Continue general practice. Great attention must be paid to the theory of the rules. The ability to obtain a correct answer to a direct exercise in a rule is not sufficient.

C.—GEOGRAPHY.

Asia Minor, Arabia, Persia, and Afghanistan.—Follow the method indicated in previous months. Draw maps for each country. Insert all names to be remembered. Note the importance of Afghanistan as a "buffer state" between Russia and India.

D.—HISTORY.

James II. and the Revolution.—Note the attempts to reintroduce Roman Catholicism. Declaration of Indulgence; Trial of the Seven Bishops, and its result. Study particularly the constitutional points which were settled by the Declaration (afterwards Bill) of Rights. Why did Monmouth's rebellion fail entirely, whereas William was supported by nearly the whole country?

E.—EUCLID.

Second Year.—Revise definitions, axioms, and postulates. Props. 1–4, and work four deductions per week.

F. ALGEBRA.

Work as many general examples as possible—back questions if available.

G. TEACHING.

Revision of any weak points.

Test Questions.

1. Penmanship.

Large Hand :—*Experimentally.*
Small Hand :—*Virtue alone is man's true happiness.*

2. Write an essay on "The Influence of Climate and Surroundings on People."

3. Paraphrase and analyse all English set, and parse any difficult words.

4. What do you understand by the "treaty ports" of China? Name the chief of them, and give their exact situation.

5. Describe carefully the trade and occupation of the people of Central Asia.

6. What points of resemblance can you discern between the empire of Japan and Great Britain?

7. Where are Fusiyama, Kuro Sivo, Tokio, Nagasaki, and the Tokiado? Say for what they are noted.

8. Describe the Caspian Sea, its shores, ports, and traffic.

9. What are the characteristic features of Siberia in winter and in summer?

10. In what does the wealth of Siberia consist, and how do travellers move from one part to another?

11. What was the Navigation Act, and what results had it?

12. Account for Cromwell's remarkable success in fighting against the Cavaliers.

13. Briefly state the account of Cromwell's dealings with foreign powers.

14. Give particulars of the Protectorate of Richard Cromwell, and the events between his abdication and the Restoration.

15. What was the Test Act? When and why was it passed?

16. (*Boys*)—

(1) p persons each gave q pence to a charity. The expense of collection comes to r shillings. How many £ did the charity receive?

Ans. $\frac{pq - 12r}{240}$.

(2) Simplify—

$$\frac{(1 + ax + by)(1 + ax - by) - (1 - ax - by)^2}{(ax + by)(1 - by) + ax}$$

Ans. 2.

$$\sqrt{\left(\frac{a^2 + b^2}{2ab} - 1\right)\left(\frac{a^2 + b^2}{2ab} + 1\right)}$$

Ans. $\frac{(a - b)(a + b)}{2ab}$.

(3) How do you show that $x^p \times x^q = x^{p+q}$, when p and q are integers? Find G.C.M. of $x^{3p} - 1$ and $x^{2p} - 1$.

Ans. $x^p - 1$.

(4) Solve—

$$\frac{7}{x - 4} - \frac{5}{x + 3} = \frac{2}{x - 5}.$$

Ans. $5\frac{14}{33}$.

$$\frac{b}{x - a} + \frac{a}{x - b} = \frac{a + b}{x}.$$

Ans. $\frac{a + b}{2}$.

(5) If 352 persons give each as many pence as the cost of collection comes to in shillings, and the charity thus receives £12, 15s., how much does each give?

Ans. 9d.

17. What is the length of the diagonal of an oblong room, the area of which is 205⅓ square yards, and one side 56 feet?

Ans. 65 feet.

18. A triangular field of 4 acres 35 square poles is bounded by a railway, a canal, and a road. The distance along the road from the canal to the railway is 1 furlong 20 poles. How far from the road is the point where the *railway crosses the canal?*

Ans. 22½ poles.

SCHOLARSHIP COURSE FOR DECEMBER 1899.

1. *Reading.*—Ten minutes' oral practice per diem, as often as possible before a competent critic. Read at least one of Scott's novels per month.

2. *Penmanship.*—A few minutes' daily practice from copy book (*Practical Teacher Copy Book*).

3. *Repetition.*—Twelve or fifteen lines weekly till known.

4. *Composition.*—Continual attention required in this subject. Send up an essay each month for correction and criticism. Write one or two essays each week, selecting from the following :—

(*a*) Gardens.
(*b*) The Ocean.
(*c*) Poverty in Great Cities.
(*d*) Poetry of the Age of Elizabeth.
(*e*) International Arbitration.
(*f*) Difficulties which Colonists experience.
(*g*) An English Village.
(*h*) "All is not gold that glitters."

5. *English Language and Literature.*

(1.) Learn twenty roots and meanings per week.
(2.) Prepare grammar and syntax of the conjunction and preposition.

Note carefully the difference between these parts of speech,

and also those words which are sometimes adverbs and sometimes prepositions and conjunctions.

The following points sometimes present difficulty :—

1. The preposition governing the gerund—for example, On entering the warehouse.
2. The preposition governing a noun clause—for example, Before that he came there was peace.
3. The preposition governing the infinitive, especially in idiomatic phrases—for example, What went ye out for to see?
4. *Beside* refers to place: The book is beside me.
   Besides means "in addition to": No one besides me.
5. *A* is a preposition in such phrases as, He is gone a-hunting. Rarely used in good English now, it is very common with country people, whose mistakes are, in many cases, correct old English expressions—for example, I be a-coming.
6. Conjunctions may be classified as subordinate and co-ordinate according to their function, *or* adversative, adverbial, hypothetical, etc., according to meaning.
7. *Than* is a comparative conjunction. He is taller than I = He is taller *than* I am tall.
8. An elliptical sentence often occurs after *as*.
9. *But* presents some difficulty. Which is correct—"Whence all but *he* had fled," or "Whence all but *him* had fled"? If the former, *but* is a conjunction. "All had fled, *but* he had not fled." If the latter, *but* is a preposition. Examples of both uses are found in good writers.

(3.) *Literature.*—Pp. 212–265, Collier's *History of English Literature.*

Chief writers:—

Pepys—*Diary.*
Butler—*Hudibras.*
Bunyan—*Pilgrim's Progress, Holy War, Grace Abounding.*
Baxter—*Saints' Everlasting Rest.*
Dryden—*Absalom and Achitophel, Hind and Panther.*
Locke—*Essay on Human Understanding, Thoughts concerning Education.*
Defoe—*Robinson Crusoe, Shortest Way with Dissenters.*

A brief life of each should be prepared, with some knowledge of the scope of the works mentioned.

The period also is important, as being that of French influence, when "the stately song of England learnt to dance the minuet of France." The rise of the newspaper and serials is also important.

(4.) Prepare lines 270–608 of *Comus.* If any difficulty is experienced in parsing and analysis, students must write for assistance. Lack of space prevents giving detailed notes.

6. *Arithmetic.*—Christian and Collar, chaps. xxxviii., xxxix., xl.: Profit and Loss, and Simple Interest. Work as many of the examples as possible. Send up any sums presenting difficulty.

7. *Algebra.*—Hall and Knight, chap. xxiv.: Harder Problems. The whole of the examples should be worked. Note particularly the "watch and clock" sums: for example, At what time between 3 and 4 are the hands opposite?

The hour hand will be a certain number of minute spaces past 3, and the minute hand will be the same number of minute spaces past 9.

Let that space be x.

Then reckoning from 3 o'clock (the last hour in *all* cases), the hour hand has gone x spaces, the minute hand $45 + x$ spaces.

Their rates of movement are as 1 to 12.

Therefore $x : 45 + x :: 1 : 12$,

$$12x = 45 + x,$$
$$11x = 45,$$
$$x = 4\tfrac{1}{11} \text{ minutes.}$$

Hence time is $49\tfrac{1}{11}$ minutes past 3.

8. *Euclid.*—Props. 40–44, Book I., with twenty deductions from Egan's *Exercises.*

9. *Geography.*

(1.) Remaining British possessions in Africa.

(2.) Revise Siberia, Japan, Indo-China, and East Indian Archipelago.

(3.) Practise memory maps. (Use *Methodic Memory Maps*, PRACTICAL TEACHER Office.)

In preparing geography of the minor African possessions, note carefully the imports and exports, chief towns, and form of government.

The Royal Niger Company—one of the very few British chartered companies—must receive special attention. Most recent information will be found in *Whitaker's Almanack* for 1899, which every student should possess.

10. *History.*—James I. to the Restoration.

The Tudor Period. *Chief Points:*—

Henry VII.
(*a*) Causes of the high prerogative exercised by the Tudors.
(*b*) Yorkist risings.
(*c*) Home government. Suspension of parliamentary life; extended use of the Star Chamber. Accumulation of money by subsidies, by confiscation and fines after revolt, by benevolences, by exactions for breaches of obsolete laws.
(*d*) Foreign policy and marriage schemes. The marriage of Prince Henry led eventually to the Reformation, and of Margaret to the accession of the Stuarts.

Henry VIII.
(*a*) Foreign war with France (Holy League against France); Field of Cloth of Gold.
(*b*) Home affairs. Power in Wolsey's hands; no Parliament for eight years. Visitation of monasteries in 1524; suppression of forty small ones.
(*c*) The question of the divorce, and consequent fall of Wolsey.
(*d*) Royal supremacy over the church established; but Henry was *not* a reformer.
(*e*) Suppression of monasteries, 1536–39. Pilgrimage of Grace. Note the use these institutions had been to the poor, and trace the results of suppression—riots, distress (tilled lands turned into sheep farms), various Acts against vagrants, and, finally, the Poor Laws of Elizabeth.
(*f*) Henry's wives.
(*g*) Lives of the chief men.

Edward VI.
(*a*) Introduction of the Protestant religion. Chief points in which the reformed religion differed from the old religion :—
(i.) English substituted for Latin in the services.
(ii.) Rejection of the worship of the Virgin and saints, and masses for the dead.
(iii.) Sacrament of both kinds administered.
(iv.) Disuse of auricular confession.
(v.) Rejection of the theory of transubstantiation.
(vi.) Clergy no longer condemned to celibacy.
(*b*) *Somerset's Protectorate.* Invasion of Scotland, and Battle of Pinkie. Vagrant Act. Act of Uniformity. Fall of the Protector.
(*c*) *Supremacy of Warwick.*

Mary.
(*a*) Lady Jane Grey's temporary sovereignty.
(*b*) Restoration of the Roman Catholic religion.
(*c*) Marriage with Philip of Spain. Wyatt's rebellion. Execution of Lady Jane Grey.
(*d*) The Marian persecution.
(*e*) The war with France, and loss of Calais.

Elizabeth.
(*a*) *Difficulties* at commencement of reign.
(i.) *At home.*—General social discontent. Impoverished treasury. No army, no navy; trade stagnant. Bitter feelings between Catholics and Protestants.
(ii.) *Abroad.*—Hostility of France, Spain, and the Pope.
(*b*) Re-establishment of the Protestant religion. Acts of Uniformity and Supremacy.
(*c*) Difficulties with Scotland and Mary Queen of Scots. Mary's deposition, imprisonment, escape, and flight to England.
(*d*) Plots against the queen. Mary's execution.
(*e*) Note the general outlines of Elizabeth's foreign policy: at first to preserve the friendship of, or at least to prevent rupture with, France and Spain; afterward to prevent these powers invading England, by helping (i.) the Netherlands against Spain, and (ii.) the Huguenots against France.
(*f*) General improvement in country. Increased trade; restored coinage; regulations for the relief of the poor; improved methods of agriculture; introduction of the weaving industry by French and Flemish refugees; disappearance of ill-will of Catholics and Protestants; development of a national patriotic spirit.
(*g*) The Spanish Armada, and results.
(*h*) The Irish rebellion.
(*i*) The growth of Puritanism.
(*j*) Advance of Parliament. (Freedom from arrest asserted. Claim to punish members and to determine contested elections. Bill for Abolition of Monopolies passed.)
(*k*) The Poor Laws.

During the Tudor period, the Renaissance—the revival of learning, the new birth of thought—took place, helped forward by invention of printing, religious controversies, foundation of schools and colleges, etc. The most remarkable result was the great outburst of English literature, especially under Elizabeth, and the production of dramas which are more and more appreciated as time passes. The "dark ages" had passed away, and the "men of the new learning" were broader minded, better read, clearer thinkers, and reformers of scientific methods. The literature of the period requires especial study.

11. *Theory of Teaching.*—Chap. vii., *Scholarship School Management.* Test reading by means of questions at end of book.

12. *Domestic Economy.*—The home: site, aspect, drainage; lighting, warming, and ventilation.

13. *Music.*—Chap. vi., *School Music Teacher.*

14. *French.*—Next four pages of *Le Trésor.*

15. *Physiography.*—Next two chapters (x. and xi.) in Gregory.

16. *Freehand.*—One or two copies each week.

CORRESPONDENCE: RULES AS USUAL.

ANSWERS TO CORRESPONDENTS.

Trust.—Penmanship: 30/60. Very poor in style and execution. Pen held sideways. Get *The Practical Teacher Copy Book* and practise assiduously.

J.D.A.—Essay: 45/60. Lacking in descriptive power. Penmanship: 40/60. Much practice from a good model needed.

Marion.—Freehand: 17/20. Lining-in too thick and hard; otherwise well drawn.

Heather.—Essay: 50/60. Penmanship: 50/60. Too stiff in style to be graceful.

(*Other correspondents answered by post.*)

The Scholarship Test Questions are unavoidably held over. Any reader may have a set by sending name and address to Editor PRACTICAL TEACHER.

OUR CERTIFICATE COURSE FOR 1899.

BY GEORGE COLLAR, B.A., B.SC.,
Head-Master of the Stockwell Pupil Teachers' School.

As the examination begins on the third of July, we have just one month left for revision and for testing back work.

It is most important that all acting teachers whose marks for reading, recitation, and practical teaching have not been sent in to the Education Department should at once communicate with their Inspector, in order to be examined and secure marks in those subjects. Candidates taking second year's papers are further reminded that they cannot obtain credit for their paper in theory of music unless they "have furnished the Department with a certificate (fly-leaf to Form 26 (2)) from some competent person (such as the organist of their church) that they have 'such an amount of skill in vocal music as is sufficient for the purpose of teaching children to sing from notes.'"

As this is a highly-marked paper (maximum 80—that is, twice as many as for drawing), and the marks are easily gained by any one who is at all musically inclined, it is well not to miss them by omitting to send in the necessary certificate.

Candidates are advised to test themselves by working the following papers (drawn up on the lines of the Department's papers) under the prescribed conditions. No reference should be made to notes or text-books until after the paper has been worked, when the worked papers should be revised with the aid of text-books, and answers to the questions not attempted should be carefully prepared.

At the examination itself, a notice will be issued to candidates on the subject of seeking or giving improper assistance, and also forbidding the introduction into the examination room of "any instrument or material for writing, except *pens, ink, pencil, knife, indiarubber, and round ruler.*

At the head of each paper you will find a statement of the time allowed for answering, and also of the number of questions you are allowed to answer. Should you answer more than the assigned number, only the assigned number coming first on your paper will be examined.

THEORY OF TEACHING.

FIRST YEAR.

(*Three hours allowed.*)

(Answer *seven* questions. Full marks are higher for Question 1 than for any other.)

1. Write notes of a lesson on one of the following subjects:—
   (1.) Cork (Standard III.).
   (2.) Roots (for infants).
   (3.) The Suction Pump.
   (4.) Multiplication of Decimals.
2. How would you help a child to acquire an idea of *number* as apart from a *number of things?*
3. Name some standard prose works which you consider suitable as reading books; say why they are suitable, and for which standards.
4. How would you carry out a series of lessons on Oral Composition?
5. What are the advantages and what the disadvantages of a course of Freehand Drawing of Ornament?
6. What is meant by "contrary propositions"? Show that of two contrary propositions it is not necessary that either should be true.
7. What steps would you take to train your children in politeness? What are the difficulties you are likely to meet?
8. What are the objects of "Introductory Questions"? Give examples of the style of questions suitable for introducing a first lesson on Division of Decimals.
9. What are the rules of correct definition?
10. What are the uses of "Pattern Reading" by the teacher? What abuses must be guarded against?

SECOND YEAR.

(Answer *three* questions from one section and *two* from each of the other two.)

Section I.

1. What is meant by Apperception? How would you apply what you have learned under this head to the teaching of Multiplication of Decimals?
2. Discuss the saying of Pestalozzi that "it is the chief business of education to pass from distinctly perceived individual notions to clear general ideas."
3. What are the objects of punishment? How would you "make the punishment fit the crime" in the case of (*a*) lateness, (*b*) want of cleanliness?
4. What are the different varieties of attention? Show that there must always be a purpose in the case of voluntary attention.

Section II.

1. Compare the respective advantages of having a teacher for each *class*, and a teacher for each subject, in a large school.
2. What rules should govern the cloak-room accommodation in a school?
3. What infectious diseases are your children likely to suffer from? How would you deal with cases of ringworm, ophthalmia, and mumps?
4. Under what heads would you criticise a specimen lesson given by a pupil teacher?

Section III.

1. What particulars is it desirable to enter in the Admission Register? Why is it advantageous to know those particulars?
2. Write notes of a lesson on one of the following:—
   (*a*) The Effects of the Roman Occupation of Britain.
   (*b*) A First Lesson on Fractions.
   (*c*) The Rise and Decay of Towns.
   (*d*) The Number Three (for infants).
3. Show the value of kindergarten teaching in training the imagination of little children.

ENGLISH COMPOSITION.

BOTH YEARS.

(*One hour allowed.*)

Write, in plain prose, a short essay on one of the following subjects:—

(*a*) Dreams.
(*b*) The Goal of Study.
(*c*) Bribery.

ARITHMETIC.

MEN—FIRST YEAR. WOMEN—FIRST AND SECOND YEARS.

(*Three hours allowed.*)

(Answer *nine* questions. The working must be given at such length as to be intelligible to the examiner.)

1. What are the advantages of using a decimal system of weights and measures? How was the length of the metre obtained, and what are the relations to it of the units of area, volume, weight, and money?
2. Resolve 274428 and 100800 into their prime factors, and thence deduce their L.C.M. and the square root of their product.
3. (*a*) What checks can you apply to the addition of long columns of figures, such as a "Total Attendance" column?
   (*b*) Explain the mental work in the following:—
      (i.) 48×48.
      (ii.) 108×112.
4. Find, by the quickest method, which is the most profitable of the following investments:—3 per cents. at 98; $2\frac{1}{2}$ per cents. at 85; $5\frac{1}{2}$ per cents. at 190; 4 per cents. at 125; and $4\frac{1}{2}$ per cents. at 160.
5. A bill for £750 was drawn on April 1 at 6 months, and was discounted on May 11, at 4 per cent. per annum. Find (*a*) the true discount, (*b*) the banker's discount, allowing 3 days' grace in each case.
6. Show that the difference between true and banker's discount on the same sum, and at the same rate, for two years, is more than twice as great as it is for one year.

   If banker's discount were reckoned in discounting payments due at the end of very long periods, what would be the present value of £750 due in 20 years, and what would be its true present value (simple interest in each case at 5 per cent.)?
7. (i.) What is *complementary addition?* What are its advantages (*a*) as a method of teaching subtraction, (*b*) as a means of reducing the work in the subsequent rules?

   (ii.) Give the mental work involved in finding the difference between 7318 and 2483 by complementary addition.
8. What fractions will produce "mixed recurring decimals," and how can you determine by inspection the number of digits in each part?

   What irreducible vulgar fractions will yield pure recurring decimals with six digits in the period?
9. A wine merchant bought a cask of claret containing 220 litres at 40 fr. per hectolitre, paid 1s. 6d. per gallon duty on importing it, and sold it at the rate of 18s. per doz. bottles (6 to the gallon). What profit did he make, allowing £7 for cost of bottles and other expenses?

10. (*a*) Show that any number formed of the same three digits is divisible by 37.

(*b*) Show that any number is divisible by 4 if twice the ten's digit added to the unit's digit gives a number divisible by 4.

11. What is the distance between the two hands of a clock at 20 minutes past 7?

12. Give a rule for multiplication of decimals which will apply to contracted as well as to uncontracted working.

Multiply 3·78546 by 4·01852 correctly to three decimal places.

[Second Year women may substitute one or more of the following for the same number of the above.]

1. Simplify :—

(*a*) $\dfrac{a^3 + b^3}{a^2 - ab + b^2} + \dfrac{a^3 - b^3}{a^2 + ab + b^2}$.

(*b*) $\left(\dfrac{a}{1-a} + \dfrac{1}{1+a}\right) \div \left(\dfrac{1}{1-a} - \dfrac{a}{1+a}\right)$.

2. Resolve into factors :—

(*a*) $m^3 + 2197n^3$.

(*b*) $x^2 - x - 90$.

(*c*) $10x^2 + 13x - 77$.

3. Solve the equations :—

(i.) $\frac{1}{2}(x + 5) - \frac{1}{3}(x + 6) + \frac{1}{4}(x + 7) = x$.

(ii.) $x + \dfrac{x - 10}{7} = x - 10 + \dfrac{x}{3}$.

(iii.) $(x + 5)(x - 6) = (x - 3)(x - 1)$.

4. What is my annual income if the income-tax on $\frac{5}{6}$ of it at 8d. in the pound is £2 less than the income-tax on $\frac{4}{5}$ of it at 7d. in the pound?

Dictation and Penmanship.

Men and Women—Both Years.

(*Half an hour allowed.*)

Candidates are not to *paint* their letters in the copy-setting exercise, but to take care that the copy is clean and without erasures.

Omissions and erasures in the dictation exercise will be counted as mistakes. The words must not be divided between two lines; there is plenty of room for the passage to be written.

(*N.B.*—Ask some one to dictate the following test to you before you read it.)

Write in large hand, as a specimen of penmanship, the word *Jurisprudence*.

Write in small hand, as a specimen of penmanship—*But yesterday the word of Cæsar might have stood against the world.*

Dictation.

Lord Beaconsfield was less an orator | than a debater, | and his reputation as a speaker will diminish | as death thins away the men | who listened to him | and saw him in action. Notwithstanding his lucidity of statement, | brilliancy of fancy, | and marvellous command of language, | his set speeches are comparative failures. Sarcasm and irony were his natural weapons; | he never showed to more advantage | than when forced to betake himself to them | in repelling a sudden attack. He had the presence of mind | that is seldom taken at a disadvantage, | great quickness of perception, | a natural gift of detecting the flaws | in his adversary's armour, | while few men knew better | the weak points in his own, | or how best to cover them. With his imperturbable coolness of manner | he could fight out a desperate campaign | in a pasteboard visor, | while to friends and foes | he contrived it should show like tempered steel.

Geography.

Men and Women—Both Years.

(*Two and a half hours allowed.*)

(Answer Question 1 and *six* others. Full marks are higher for Question 1 than for any other. Answers may be illustrated by sketch maps.)

1. Discuss (*a*) the advantages, (*b*) the disadvantages, to the mother country and to the colony, of a federal government, such as that proposed for the Australian colonies, or that of British North America.

2. What additions have been made to British territory in India and China during the Queen's reign? State whether each is of strategic or commercial importance.

3. Give a concise account of the climate, productions, towns, and commerce of (*a*) Newfoundland, or (*b*) Ceylon, or (*c*) Tasmania.

4. What important lines of steamers connect England with her possessions in the East? Give an account of one of the chief trade routes to the East.

5. Describe (*a*) the river St. Lawrence, or (*b*) the Ganges, giving the productions and the chief industries of the river basin.

6. Why is Queensland hotter than Tasmania? Why is British Columbia warmer and moister than Manitoba? Which side of New Zealand receives the greater rainfall, and why?

7. Give the position and show the importance of the following:—Wei-hai-wei, Vancouver City, Rangoon, Albany, Hong-Kong, Bhamo.

8. Enumerate the islands included in the British West Indies, and give a brief outline of the history of the group.

9. Say all you can about (*a*) Western Australia, or (*b*) Burmah, or (*c*) South Island, New Zealand.

10. Describe carefully British Guiana, referring if you can to recent events.

English History.

Men and Women—Both Years.

(*Two hours allowed.* Answer *five* questions.)

1. What claims did Louis the Fourteenth advance on the death of Philip the Fourth and of Charles the Second, kings of Spain? And what steps were taken to meet his attempts to enforce those claims?

2. What coalitions of European states were formed by William the Fourth? What was the object of each?

3. Give as clear an account as possible of the conditions on which William the Third and Mary became king and queen of England.

4. Describe fully the causes which tended to make England and Holland friendly in the reign of Charles the Second, and those which led to rivalry. Trace the course of the relations between the two countries during the reign.

5. Give an account of the Long Parliament.

6. Write an account of the origin and course of the campaign of 1648, and give a few details of the events which led directly to the trial of the king.

7. Relate briefly the chief events in the Protectorate of Oliver Cromwell.

8. What events in the reign of James the Second had most effect in bringing about the Revolution?

English.

Men and Women—First Year.

(*Three hours allowed.*)

(Answer Question 1 and *two* others in Section 1, and *three* questions in Section 2.)

Section I.

1. Analyse the following, and parse the words in italic :—

When the Athenians had long contended against the power of Philip, he demanded of them *to give up* their orators, *as* well *knowing* their *opposition would be* soon at an end if it *were* not *irritated* from time to time by these tongue-warriors.

2. What other spellings are allowable for the following words:—*inflection, programme, rhyme, mediæval, restoration?* What is there to be said for or against them?

3. Account for the adverbial forms—*betimes, whilom, erewhile, piecemeal, ashore;* and give adverbs corresponding with *shy, jar, fast, kindly, lowly.*

4. In what various ways may the vocabulary of a language be increased, besides by borrowing from foreign languages? Give examples.

5. Give a list of the different sounds represented in English by the letter A.

Section II.

1. Mention some of the "society abuses" which Addison and his fellow-essayists endeavoured to reform.

2. What light is thrown by the Essays upon the state of the book trade, and the manner of publishing books and periodicals?

3. What were Addison's political opinions? How are they reflected in the Essays?

4. What is a masque? Narrate the circumstances under which *Comus* was written.

5. What are the characteristics of an elegy? Do you consider *Lycidas* a perfect elegy? What allusions are there in it to the writer's own personal matters, and what to political questions of the day?

6. Annotate the following :—

(*a*) "Peace, brother: be not over-exquisite
To cast the fashion of uncertain ills."

(*b*) "More med'inal is it than that Moly
That Hermes once to wise Ulysses gave."

(*c*) "Whilom she was the daughter of Locrine,
That had the sceptre from his father Brute."

(*d*) "He knew
Himself to sing, and build the lofty rhyme."
(*e*) "Meanwhile the rural ditties were not mute,
Tempered to the oaten flute."
(*f*) "Like to that sanguine flower inscribed with woe."
(*g*) "'Who hath reft' (quoth he) 'my dearest pledge?'"
(*h*) "That two-handed engine at the door
Stands ready to smite once, and smite no more."

Men and Women—Second Year.

(Answer *two* questions in each section.)

Section I.

Questions 1, 2, 3 in First Year, Section II.

Section II.

King Lear.

1. Analyse the following, and parse the words in italic:—
"Come, *let's away* to prison:
We *two alone* will sing *like birds* i' the cage:
When thou dost ask *me blessing*, I'll kneel down,
And ask of thee forgiveness: so we'll live,
And pray, and sing, and tell old tales, and laugh
At gilded butterflies, and *hear* poor *rogues*
Talk of court news."

2. What indications are given of the state of Lear's mind at the beginning of the play? Trace the changes in his mental condition as the play proceeds.

3. From what source did Shakespeare derive the story of *King Lear?* Mention any anachronisms in the play.

4. Annotate the following, with special reference to words in italic:—
(*a*) "The hedge-sparrow fed the cuckoo so long,
That *it* had *it* head bit off by *it* young."
(*b*) "Our *means* secure us, and our *mere* defects
Prove our commodities."
(*c*) "Half-way down
Hangs one that gathers samphire."
(*d*) "To *scant* my *sizes*."
(*e*) "The safer sense will ne'er *accommodate*
His master thus."
(*f*) "Why I do trifle thus with his despair
Is done to cure it."
(*g*) "At her late being here
She gave strange *œillades* and most speaking looks
To noble Edmund."
(*h*) "Thy tender-hefted nature shall not give
Thee o'er to harshness."

Section III.

1. Sketch the character of Jaques. Quote lines which show the Shakespearian pronunciation of his name.

2. Quote passages showing the true nobleness of Orlando's character.

3. Sketch the characters of Touchstone and Audrey.

4. Give a few notes on the art shown by Shakespeare in the plot of *As You Like It*, and show what was gained by interweaving the story of Orlando with that of the banished duke.

Geometry.

(All the questions may be attempted. Capital letters, not numbers, must be used in the diagrams. All generally understood abbreviations and symbols for *words* may be used, but not symbols for *operation*, such as $-$, $+$, $\times$, PQ², PQ, RS.)

Men—First Year.

1. If a right line intersect two parallel right lines, prove that it makes the alternate angles equal to one another.

2. If two equal triangles stand upon opposite sides of the same base, prove that the straight line joining their vertices is bisected by the base or by the base produced.

3. If a straight line be divided into any two parts, the squares on the whole line and on one of the parts are equal to twice the rectangle contained by the whole line and that part, together with the square on the other part.

4. Prove that if two right lines intersect within a circle, the rectangle contained by the segments of the one are equal to the rectangle contained by the segments of the other.

5. On a given right line describe a segment of a circle containing an angle equal to a given rectilineal angle.

6. Prove that if a circle be divided into two segments, the angle *in* one segment is equal to the angle *of* the other segment.

7. Find a point O within a given acute-angled triangle such that the angles AOB, AOC, and BOC shall be equal.

8. Prove that the sum of the squares on two sides of a triangle is double the sum of the squares on half the base, and on the line joining the vertex to the middle point of the base.

Men—Second Year.

(See general instructions above.)

1. On a given right line describe a regular pentagon.

2. Inscribe a circle in a given triangle. Also escribe a circle to the same triangle—that is, describe a circle touching one side of the triangle and the other two sides produced.

3. If a straight line be drawn parallel to one of the sides of a triangle, it shall cut the other sides, or those produced, proportionally; and conversely, if the sides, or the sides produced, be cut proportionally, the straight line which joins the points of section shall be parallel to the remaining side of the triangle.

4. Construct an isosceles triangle having its area and vertical angle equal to those of a given scalene triangle.

5. Prove that it is impossible to inscribe a circle in any parallelogram whose sides are not all equal.

6. Draw a triangle having given two of its angles and the radius of the inscribed circle.

7. AD is a straight line drawn from the vertex A to the middle point D of the base BC of the triangle ABC. The angles ADB, ADC are bisected by DE and DF respectively, meeting AB and AC in E and F. Prove that EF is parallel to BC.

8. Prove that the perpendicular drawn from the right angle to the hypotenuse of a right-angled triangle is a mean proportional between the segments of the hypotenuse.

9. Prove that the equilateral triangle described on the hypotenuse of a right-angled triangle is equal to the sum of the equilateral triangles described upon the other two sides.

Women—First Year.

1. Prove that the straight lines drawn from the extremities of one side of a triangle to a point within the triangle are together less than the other two sides of a triangle, but contain a greater angle.

2. Prove that the diagonals of an oblong bisect each other.

3. If one side of a triangle be produced, the exterior angle is greater than either of the interior and opposite angles.

4. In a given straight line of unlimited length find a point which shall be equidistant from two given points. When is this impossible?

5. Prove that two straight lines cannot have a common segment.

6. Show that the straight line bisecting the vertical angle of an isosceles triangle bisects also the base.

7. Show that any point in the line bisecting an angle is equidistant from the lines containing the angle. (N.B.—*The distance of a point from a line is the length of the perpendicular drawn from the point to the line.*)

8. Given that the opposite sides and angles of a parallelogram are equal, prove that the diagonals bisect each other.

Algebra and Mensuration.

Men—First Year.

(Answer *eight* questions in Algebra and *one* in Mensuration. *Three hours allowed.*)

1. Find two numbers such that their sum is 24 and the sum of their cubes is 5256.

2. Simplify:—

$$\cfrac{1}{a+\cfrac{1}{1+\cfrac{a+1}{3-a}}}$$

and

$$\frac{x^3-a^3}{x^2+ax+a^2}-\frac{x^3+a^3}{x^2-ax+a^2}.$$

3. Find the price of eggs per score when two more in a shilling's worth lowers the price a penny a dozen.

4. Find the highest common factor of

$$x^4-10x^2+9;\ x^4+7x^3+11x^2-7x-12;$$

and

$$x^4+2x^3-16x^2-2x+15.$$

5. Under what condition is $x^4+3x^3-4x^2-7x+a$ divisible by x^2-2x+3?

6. Multiply together, in the neatest way possible,
$x^2-(b-c)x-bc$, $x^2-(c-a)x-ac$, $x^2-(a-b)x-ab$,
and divide the result by

$$x^3-(a+b+c)x^2+(bc+ca+ab)x-abc.$$

7. A sets out from London to Rugby, and B at the same time from Rugby to London, a distance of 84 miles, and A reaches Rugby 9 hours and B reaches London 16 hours after they met on

the road. Find the time each took for the journey, their rates being supposed uniform.

8. Explain where the difficulty arises in solving the equations—

$$x + 71y - 53z = 400.$$
$$3x + 73y + 51z = 401.$$
$$19x + 89y + 36z = 408.$$

9. (*a*) How many terms of the geometrical progression $1 + 3 + 9 + 27 \ldots\ldots$ amount to 364?

(*b*) Ten numbers are in arithmetical progression; the third is 10 and the seventh 30. Find their sum.

10. A person who saved every year $\frac{3}{4}$ of what he saved the previous year had saved £3367 in six years. How much would he save in eight years?

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1. You are told that the sides of a quadrilateral are 36, 40, 45, and 50 feet, and the diagonal 60. What is the difference between the areas of the two figures which satisfy these conditions?

2. What is the difference in area between a circle of 8 feet radius and the parallelogram described about it?

Women—Second Year.

(Answer *eight* questions. *Three hours allowed.*)

1, 2, 3, 4, 5. See First Year Men's Algebra, 2, 4, 5, 6, 8.

6. Explain the rule respecting the signs of quantities taken out of brackets, and simplify

$$-[a + x - (a + 2x) - \{a - 3x - 4(a + x) - 3a\} - 2(2a - x)].$$

7. Divide $\left(\frac{a^2}{b^2} + \frac{b^2}{a^2} - 2\right)^2$ by $\left(\frac{a}{b} - \frac{b}{a}\right)^2$.

8. Find the value of $\frac{x + 2a}{2b - x} + \frac{x - 2a}{2b + x} - \frac{4ab}{4b^2 - x^2}$,

when $x = \frac{ab}{a + b}$.

9. A's share is five-sevenths of a certain property, and B owns the rest. If A lose £40, his share of the remainder will be three-fifths. Find the value of B's share.

10. In 1875 a man found that the number of months in his age was exactly half the number denoting the year of his birth. When was he born?

Men—Second Year.

(Answer *eight* questions in Algebra and *one* in Mensuration.)

1. What is the present worth of a perpetual annuity of £10 payable at the end of the first year, £20 at the end of the second, £30 at the end of the third, and so on, increasing £10 each year; interest being taken at 5 per cent. per annum?

2. How many years will it take £100 to accumulate to £1000 at 4 per cent. compound interest?

[$\log 2 = 0{\cdot}3010300$; $\log 13 = 1{\cdot}1139434$.]

3. What value of a, b, and c will make both

$x^4 + ax^3 + bx^2 + cx + 1$ and $x^4 + 2ax^3 + 2bx^2 + 2cx + 1$

perfect squares?

4. How many words in which the first and third letters are consonants, but not the same, and the second letter a vowel, can be formed with an alphabet of twenty consonants and five vowels?

5. Solve the equation $(a^{\frac{1}{3}} + x^{\frac{1}{3}})^{\frac{1}{3}} = (a^{\frac{1}{3}} + x^{\frac{1}{3}})^{\frac{1}{2}}$.

6. Sum the series $1 + 2^2x + 3^2x^2 + 4^2x^3 + \ldots\ldots (n + 1)^2x^n$.

7. To do a piece of work A requires $\frac{2}{3}$ as long as B; but A's wages are 1s. a day more than B's. The work costs 22s. more if A does it than if B does it, and if they work together it costs 10 guineas. Find the daily wages of each.

8. What is the relation between a, b, p, and r if the roots of the equation $x^2 + px + q = 0$ are the reciprocals of those of $x^2 + ax + b = 0$?

9. Two papers out of fourteen set in an examination are mathematical; in how many orders can the papers be given out so that the two mathematical papers are not consecutive?

10. Write down the 5th term of $(\frac{1}{2}x - 3y)^7$, and the 6th term of $(x^2 - 5^2)^8$.

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1. A triangular sheet of lead, $\frac{1}{8}$ inch thick, whose sides are 5, 12, and 13 inches, is melted and cast into a cylinder of 1 inch radius. Find the height of the cylinder.

2. A cylinder and a truncated cone have the same height, and the cylinder has half the volume of the cone. If the diameter of the smaller circle of the cone is equal to the diameter of the cylinder, find the diameter of the other.

Latin.

Men and Women—First Year.

(Answer the first *two* questions and *two* others. *Two hours allowed.*)

1. Translate:—

Num infitiari potes te illo ipso die meis praesidiis, mea diligentia circumclusum commovere te contra rem publicam non potuisse, cum te discessu ceterorum nostra tamen, qui remansissemus, caede te contentum esse dicebas? Quid? cum te Praeneste Kalendis ipsis Novembribus occupaturum nocturno impetu esse confideres, sensistine illam coloniam meo jussu meis praesidiis, custodiis, vigiliis que esse munitam?

2. Translate into Latin:—

(*a*) Now what indeed is this life of yours? For I will so speak with you as not to seem moved by hatred, as I ought, but by pity, which is certainly not due to you.

(*b*) Now I understand, if that man reaches the Manlian camp, whither he is setting out, no one will be so stupid as not to see that a conspiracy has been worked up, and no one so wicked as not to confess it.

3. Explain fully what is meant by gerundial attraction. Give examples.

4. Illustrate, by means of examples, the various ways in which a purpose may be denoted in Latin.

5. Decline in the singular—*anceps, furor, bos;* and give the principal parts of *sperno, mulgeo, differo,* and *pendo.*

Second Year.

(Answer first *three* questions and *two* others.)

1 and 2. Same as 1 and 2 above.

3. Translate:—

Et jam prima novo spargebat lumine terras
Tithoni croceum linquens Aurora cubile;
jam sole infuso, jam rebus luce retectis
Turnus in arma viros armis circumdatus ipse,
suscitat, aeratasque acies in proelia cogit
quisque suas, variisque acuunt rumoribus iras.
Quin ipsa arrectis, visu miserabile in hastis
praefigunt capita et multo clamore sequuntur
Euryali et Nisi.

4. Translate into Latin:—

(*a*) Have you done as I told you?

(*b*) Having girded on his sword, Turnus invaded the town.

(*c*) The Rutuli spread over the grass indulge in wine, and tilt the copper cups.

5. How is a direct prohibition expressed in Latin prose?

6. What constructions are used with *prohibere, praestare, meminisse, potiri, abuti?*

French.

Men and Women—First Year.

(Answer Questions 1 and 2, and *two* others. *Two hours allowed.*)

1. Translate:—

Or puisque les miroirs communs annoncent en vain la vérité, et que chacun est content de sa figure; puisqu'ils ne peuvent faire connaître aux hommes leurs imperfections physiques, à quoi servirait mon miroir moral? Peu de monde y jetterait les yeux, et personne ne s'y reconnaîtrait, excepté les philosophes.—J'en doute même un peu.

2. Translate into French:—

"Stop, Joannetti," I said to him, "stop, run and buy the brush."

"But, sir, do you want to stay thus with one shoe white and the other black?"

"Go, I tell you, and buy the brush; leave that dust on my shoe."

He went out: I took the duster, and I cleaned, with pleasure, my left shoe, upon which I dropped a tear of repentance.

3. Explain the principal rules concerning the position of the pronouns *me, te, se, le, la, lui, les,* and also *moi, toi,* and *soi.*

4. State and explain the rules for the agreement of the past participle in the case of reflexive verbs.

5. Explain the use of the letter *h* in French, and comment on *le héros, là haut, la haine, l'homme, le huitième.*

Men and Women—Second Year.

(Answer Questions 1, 2, and 3, and *two* others.)

1 and 2. Same as First Year 1 and 2.

3. Translate *La verre d'Eau,* Act ii., Scene 10, last nineteen speeches, beginning—

"La Duchesse. *Ah! vous vous méfiez de moi.*"

4. *Nous nous sommes vus, mais nous ne nous sommes pas parlé.* Why is the first participle written in the plural but not the second?

5. How is the conditional formed in French? Explain the forms *je viendrais, je verrais, j'aurais.*

6. Distinguish between *moins* and *moindre, pire* and *pis, plutôt* and *plus tôt, avant* and *avant que.*

Music.

Unfortunately we are precluded by want of space from giving Music Papers.

QUERY COLUMN.

RULES.

1. Each correspondent is restricted to *one* question.
2. Each query must be accompanied by the *coupon* which appears on the back wrapper of the current number of the Journal.
3. CORRESPONDENTS MUST IN ALL CASES STATE THE SOURCE FROM WHICH THEIR QUERY HAS BEEN OBTAINED.

The Editor reserves to himself the right to decline to answer any question which is, in his judgment, unsuited to the Magazine.

Math.—Establish the identities—

(*a*) $\sin^2(A-B) + \sin^2(C-B) = \sin^2(A-C) + 2\sin(A-B)\sin(C-B)\cos(A-C)$.

(*b*) $\tan\frac{\pi}{2^{n+1}} + 2\cdot\tan\frac{\pi}{2^n} + 2^2\tan\frac{\pi}{2^{n-1}} + \ldots + 2^{n-2}\tan\frac{\pi}{2^2} + 2^{n-1} = \cot\frac{\pi}{2^{n+1}}$.

Find the value of $\sin\theta$ from the equation—

(*c*) $$\sin(\theta+\alpha) + \cos(\theta+\alpha) = 2\sin\frac{\pi}{4}.$$

(Third Stage, S. and A., 1897.)

(*a*) Taking the left-hand side,

$$\begin{aligned}&\sin^2(A-B) + \sin^2(C-B)\\ &= \tfrac{1}{2}[1-\cos 2(A-B)] + \tfrac{1}{2}[1-\cos 2(C-B)]\\ &= 1 - \tfrac{1}{2}[\cos 2(A-B) + \cos 2(C-B)]\\ &= 1 - \tfrac{1}{2}[2\cos(A+C-2B)\cos(A-C)]\\ &= 1 - \cos(A-C)\cos(A+C-2B).\end{aligned}$$

Taking the right-hand side,

$$\begin{aligned}&\sin^2(A-C) + 2\sin(A-B)\sin(C-B)\cos(A-C)\\ &= 1 - \cos^2(A-C) + 2\sin(A-B)\sin(C-B)\cos(A-C)\\ &= 1 - \cos(A-C)[\cos(A-C) - 2\sin(A-B)\sin(C-B)]\\ &= 1 - \cos(A-C)[\cos(A-C) - \{\cos(A-C)\\ &\qquad - \cos(A+C-2B)\}]\\ &= \underline{1 - \cos(A-C)[\cos(A+C-2B)]}.\end{aligned}$$

(*b*) We assume that you are familiar with the relation

$$\tan x = \cot x - 2\cot 2x.$$

Using this, we get

$$\tan\frac{\pi}{2^{n+1}} = \cot\frac{\pi}{2^{n+1}} - 2\cot\frac{\pi}{2^n}, \text{ since } 2\cot\frac{2\pi}{2^{n+1}} = 2\cot\frac{\pi}{2^n}.$$

$$2\tan\frac{\pi}{2^n} = 2\cot\frac{\pi}{2^n} - 2^2\cot\frac{\pi}{2^{n-1}}.$$

. . . . . .

$$2^{n-2}\tan\frac{\pi}{2^3} = 2^{n-2}\cot\frac{\pi}{2^3} - 2^{n-1}\cot\frac{\pi}{2^2}.$$

$$2^{n-1} = 2^{n-1}.$$

Since $\cot\frac{\pi}{2^2} = \cot\frac{\pi}{4} = 1$, we find that the sum of the terms on the right-hand side is $\cot\frac{\pi}{2^{n+1}}$, all the other terms cancelling. Hence the identity is proved.

(*c*) $$\sin(\theta+\alpha) + \cos(\theta+\alpha) = 2\sin\frac{\pi}{4}.$$

"Preparing" the left-hand side so as to get it in the form $\sin A\cos B + \cos A\sin B$, we have

$$\sin(\theta+\alpha)\times\frac{1}{\sqrt{2}} + \cos(\theta+\alpha)\times\frac{1}{\sqrt{2}} = \frac{2}{\sqrt{2}}\sin\frac{\pi}{4}$$

$$\sin(\theta+\alpha)\cos\frac{\pi}{4} + \cos(\theta+\alpha)\sin\frac{\pi}{4} = \frac{2}{\sqrt{2}}\times\frac{1}{\sqrt{2}}$$

$$\sin\left(\theta+\alpha+\frac{\pi}{4}\right) = 1.$$

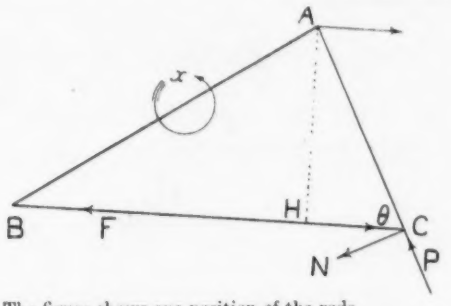
$$\therefore\ \theta+\alpha+\frac{\pi}{4} = \frac{\pi}{2}$$

$$\theta = \frac{\pi}{4} - \alpha.$$

$$\therefore\ \sin\theta = \sin\left(\frac{\pi}{4}-\alpha\right) = \sin\frac{\pi}{4}\cos\alpha - \cos\frac{\pi}{4}\sin\alpha$$

$$= \underline{\frac{1}{\sqrt{2}}(\cos\alpha - \sin\alpha)}.$$

Captain Cuttle.—The rod AB is movable in a given plane about one extremity, A, and is hinged at B to another rod, BC, without weight, whose other extremity, C, is fastened to a ring constrained to move along a smooth rod, AC, passing through A. If AB be acted on by a given couple, find the force which must act at C in the line CA to maintain equilibrium, and prove that the pressure on the rod AC at C will vary as AC, the couple being the same. (London Univ. B.Sc., 1894.)



The figure shows one position of the rods.

Draw AH at right angles to BC.

Let the magnitude of the couple be x, and the angle ACB be θ.

What are the forces keeping the rod AB in equilibrium? The couple x, a single force at A, and an equal single force at B. The direction of the latter must obviously be along the line BC. Let F be the magnitude of each of these forces. Then

$$x = \mathrm{F}\times\mathrm{AH}, \text{ and } \mathrm{F} = \frac{x}{\mathrm{AH}} = \frac{x}{\mathrm{AC}\sin\theta}.$$

Having found the force in the rod BC, now consider the equilibrium of the ring C.

The forces acting are:—(1) a force F along BC; (2) a force N along CK, supplied by the rod AC: since the rod is smooth, CK is perpendicular to AC; (3) the required force P along CA. Resolving along to AC, we have

$$\mathrm{P} - \mathrm{F}\cos\theta = 0.$$

$$\therefore\ \mathrm{P} = \mathrm{F}\cos\theta = \frac{x\cos\theta}{\mathrm{AC}\sin\theta} = \underline{\frac{x}{\mathrm{AC}\tan\theta}}. \quad \text{Ans.}$$

Resolving perpendicular to AC, we have

$$\mathrm{N} = \mathrm{F}\sin\theta = \frac{x\sin\theta}{\mathrm{AC}\sin\theta} = \underline{\frac{x}{\mathrm{AC}}}.$$

Thus the pressure on the rod AC at C varies *inversely* as AC.

Puzzled Patty.—What must 2312 be multiplied by to make a perfect square?

The factors of 2312 are 2, 2, 2, 17, 17; therefore it is evident that we need only multiply 2312 by 2 to get a perfect square, for then we shall have $4\times4\times17\times17$, or 68×68. And 2 is the least multiplier necessary, though 8 (which you give as the answer) and an infinite number of other multipliers would also make it a perfect square.

M.A.—Solve the equation $(x+1)^4 = 4x^2 + 8x + 49$. (S. and A., 1897.)

$$(x+1)^4 = 4(x^2+2x+1) + 45 = 4(x+1)^2 + 45$$

$$(x+1)^4 - 4(x+1)^2 - 45 = 0,$$

$$[(x+1)^2 - 9][(x+1)^2 + 5] = 0.$$

This will be true if $(x+1)^2 - 9 = 0$, or if $(x+1)^2 + 5 = 0$.

In the former case, $x+1 = \pm 3$, $\therefore\ \underline{x = 2 \text{ or } -4}$.

In the latter, $(x+1)^2 + 5 = 0$,

$$x+1 = \pm\sqrt{5},\ \therefore\ \underline{x = \pm\sqrt{5} - 1}.$$

Viking.—Prove the relation

$$\frac{\sin\alpha\sin2\alpha + \sin\alpha\sin4\alpha + \sin2\alpha\cdot\sin7\alpha}{\sin\alpha\cos2\alpha + \sin2\alpha\cos5\alpha + \sin\alpha\cdot\cos8\alpha} = \tan5\alpha.$$

Multiply the numerator and denominator by two, and we get

$$\frac{(\cos\alpha - \cos3\alpha) + (\cos3\alpha - \cos5\alpha) + (\cos5\alpha - \cos9\alpha)}{(\sin3\alpha - \sin\alpha) + (\sin7\alpha - \sin3\alpha) + (\sin9\alpha - \sin7\alpha)}$$

$$= \frac{\cos\alpha - \cos9\alpha}{\sin9\alpha - \sin\alpha} = \frac{2\sin5\alpha\cdot\sin4\alpha}{2\cos5\alpha\cdot\sin4\alpha} = \tan5\alpha.$$

W. F. Bew.—Consult any of the standard books on arithmetic.

W. B. Jamieson.—Show that if x, y, z be unequal, and

$$y = \frac{a + bz}{c + dz}, \quad z = \frac{a + bx}{c + dx}, \quad x = \frac{a + by}{c + dy},$$

then will $ad + bc + b^2 + c^2 = 0$.

(C. Smith's *Algebra*, Ex. xvi., No. 14.)

Our object is to try to eliminate x, y, and z from the three given equations.

$$x = \frac{a + by}{c + dy} = \frac{a + b\left(\frac{a + bz}{c + dz}\right)}{c + d\left(\frac{a + bz}{c + dz}\right)} = \frac{ac + adz + ab + b^2z}{c^2 + cdz + ad + bdz}$$

$$= \frac{ac + ab + (ad + b^2)\left(\frac{a + bx}{c + dx}\right)}{c^2 + ad + (cd + bd)\left(\frac{a + bx}{c + dx}\right)}$$

$$= \frac{(ac + ab)(c + dx) + (ad + b^2)(a + bx)}{(c^2 + ad)(c + dx) + (cd + bd)(a + bx)}$$

$$\therefore x(c^3 + 2adc + abd) + x^2(ad^2 + c^2d + db^2 + bcd)$$
$$= abc + ac^2 + a^2d + ab^2 + x(acd + 2abd + b^3),$$
$$x^2d(ad + bc + b^2 + c^2) + x(c^3 - b^3 + acd - abd)$$
$$= a(ad + bc + b^2 + c^2)$$
$$x^2d(ad + bc + b^2 + c^2) + x[(c - b)(c^2 + bc + b^2) + ad(c - b)]$$
$$= a(ad + bc + b^2 + c^2),$$

or $$[x^2d + (c - b)x - a][ad + bc + b^2 + c^2] = 0 \quad \ldots \quad (4).$$

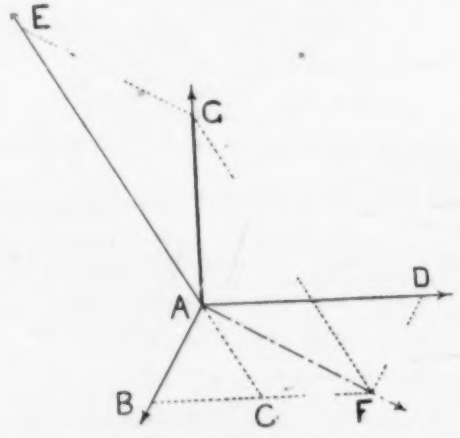
Now if $$x^2d + (c - b)x - a = 0 \quad \ldots \quad (5),$$

$$x(c + dx) = a + bx,$$

or $$x = \frac{a + bx}{c + dx}.$$

Comparing this with the third given equation, this would give $x = y$. But x, y, and z are unequal, hence equation (5) cannot be true; the other factor in equation (4) must therefore be zero, or $ad + bc + b^2 + c^2 = 0$.

A Constant Subscriber (*Newfoundland*).—(*a*) Explain how to find the *rate* at compound interest for a time of ten years without



using logarithms, having given the *principal* and *amount*. If 300 dollars amount to 420 dollars in ten years, find *rate*.

(*b*) ABC is an equilateral triangle. A particle has simultaneous velocities represented by AB, 2BC, and 3CA. Find by aid of scales or otherwise its resultant velocity.

(Council Higher Education Exam., Seniors, 1898.)

(*a*) In compound interest, when the interest is added annually, we have

$$\text{amount} = \text{principal}\left(1 + \frac{\text{rate}}{100}\right)^{\text{No. of years.}}$$

In the example given,

$$420 = 300\left(1 + \frac{x}{100}\right)^{10},$$

where x is *rate* required.

$$\frac{420}{300} = 1{\cdot}4 = \left(1 + \frac{x}{100}\right)^{10}.$$

Expanding by means of the binomial theorem, we get

$$1{\cdot}4 = 1 + 10\cdot\frac{x}{100} + \frac{10 \times 9}{|2}\left(\frac{x}{100}\right)^2 + \frac{10 \times 9 \times 8}{|3}\left(\frac{x}{100}\right)^3 + \ldots \text{ etc.}$$
$$= 1 + {\cdot}1x + {\cdot}0045x^2 + {\cdot}00012x^3 + {\cdot}0000021x^4 + \ldots\ldots$$

Now if x is small, say less than 4, the terms in the above expansion become less and less, and a very approximate result may be obtained by neglecting all terms beyond that in x^2. Thus $1{\cdot}4 = 1 + {\cdot}1x + {\cdot}0045x^2$ very nearly.

Solving this quadratic equation in the ordinary way, we get $x = \underline{3{\cdot}45\%}$.

The answer obtained by the ordinary method of using logarithms is $\underline{3{\cdot}42\%}$.

(*b*) Taking any point, say A for convenience, the velocities are represented by AB, AD, and AE.

Notice that a velocity 2BC means a velocity of magnitude 2BC, and of direction parallel to the direction BC *from B to C*.

The resultant of AB and AD is AF, obtained by completing the parallelogram ADFB.

Similarly, the resultant of AF and AE is AG.

By using scales, you will find that AG = 1·73 AB; also the angle GAD = 90°.

X. Y. Z.—Find whole area enclosed by the curve $r^2 = a^2 \cos 2\theta$, and show that its total length is $2a\int_o^{\frac{\pi}{2}} \frac{d\phi}{\cos^{\frac{1}{2}}\phi}$.

(London B.Sc., 1898.)

First roughly plot the curve from $\theta = o$ to $\theta = 2\pi$, and thus obtain an idea of its shape. Satisfy yourself that the whole area is four times that between $\theta = o$ and $\theta = \frac{\pi}{4}$.

Hence area $= 4 \times \frac{1}{2}\int_o^{\frac{\pi}{4}} r^2 . d\theta = 2a^2\int_o^{\frac{\pi}{4}} \cos 2\theta . d\theta$

$$= 2a^2\left[\frac{\sin 2\theta}{2}\right]_o^{\frac{\pi}{4}} = \underline{a^2}. \quad \text{Ans.}$$

The total length of the curve is four times that between $\theta = o$ and $\theta = \frac{\pi}{2}$.

In polar co-ordinates the length of a curve is given by

$$s = \int\left(r^2 + \frac{dr^2}{d\theta^2}\right)^{\frac{1}{2}} . d\theta.$$

Now $$r^2 = a^2 \cos 2\theta.$$
$$2r . dr = -2a^2 \sin 2\theta . d\theta.$$
$$\therefore \frac{dr}{d\theta} = -\frac{a^2 \sin 2\theta}{r}.$$

Hence the total length of the above curve will be

$$4\int_o^{\frac{\pi}{4}}\left(a^2\cos 2\theta + \frac{a^4 \sin^2 2\theta}{a^2 \cos 2\theta}\right)^{\frac{1}{2}} . d\theta$$

$$= 4\int_o^{\frac{\pi}{4}}\left(\frac{a^4\cos^2 2\theta + a^4 \sin^2 2\theta}{a^2 \cos 2\theta}\right)^{\frac{1}{2}} . d\theta$$

$$= 4a\int_o^{\frac{\pi}{4}}\left(\frac{1}{\cos 2\theta}\right)^{\frac{1}{2}} . d\theta.$$

Now evidently $\phi = 2\theta$, and $\therefore d\theta = \frac{d\phi}{2}$, and above answer becomes

$$4a\int_o^{\frac{\pi}{2}}\left(\frac{1}{\cos^{\frac{1}{2}}\phi}\right)\frac{d\phi}{2} = 2a\int_o^{\frac{\pi}{2}}\left(\frac{d\phi}{\cos^{\frac{1}{2}}\phi}\right).$$

Excelsior.—If you will comply with Rule 2, Query Column, we shall be pleased to furnish solution required. Repeat query.

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NOTES ON ADVANCED AND HONOURS PHYSIOGRAPHY.

Novæ.—Mrs. Fleming, who had already discovered four novæ, has added yet another to her list of new star discoveries. The nova thus brought to light is in Sagittarius. The approximate position of Nova Sagittarii for 1900 is

R.A. = 18 h. 56 m. 12·2 s. Decl. = 13° 18′ 16″.

The nova was discovered, like several of its predecessors, during the examination of the Draper memorial photographs of stellar spectra. Mr. Pickering, who contributes a note on the subject to the May number of *Knowledge*, gives the following additional details:—"During the last four centuries fifteen stars have appeared, which are commonly regarded as novæ. These stars are, in general, near the central line of the Milky Way. Their average galactic latitude is 11°·2, while, if uniformly distributed in the sky, it would be 30°. The region whose galactic latitude is less than 30° has an average equal to one-half of the whole sky. Fourteen of these stars appeared in this region, and only one (Nova Coronæ) outside of it. Nova Andromedæ and Nova Centauri had spectra without bright lines, unlike other novæ. Omitting them, the average galactic latitude of the others is 9°. The galactic latitude of Nova Coronæ is 46°·8, and this seems to be the only known exception to the rule that all novæ having bright lines in their spectra have appeared near the central line of the Milky Way. Omitting this star, the average galactic latitude of the other three is 5°·8. The only novæ known to have bright lines in their spectra are those which appeared in Corona, Cygnus, Perseus, Auriga, Norma, Carina, and Sagittarius. Omitting the first of these, the mean galactic latitude is 4°·6. The probability that such a distribution is due to accident is extremely small." It is almost certain that there is some connection between the galaxy and the new stars whose spectra contain bright lines.

Clouds.—*Knowledge* for May contains an interesting article from the pen of Mr. James Quick on Clouds. The article is illustrated by a beautiful plate of typical clouds. We recommend all students of physiography to read this article and to examine the plate. In connection with Aitken's theory as to the part played by dust in cloud and fog formation, Mr. Quick quotes the well-known experiment of filling a flask with air that has been deprived of its dust by filtration through cotton wool, into which dust-free atmosphere moist air is allowed to penetrate, with the result that no fog or cloud is observed, although large drops of water run down the sides of the flask, because there a large surface is presented for the deposition of the moisture. This is applied to the Scotch mist, with its big drops, on the one hand, and the thick, finely-divided fog of London and large towns in general on the other. The atmosphere of extreme purity in Scotland and the dust-laden air of London account for the two extremes. As to the absolute necessity for dust-particles or other solid nuclei, Mr. Quick writes as follows:—"Although it is conclusive that water vapour must have nuclei, around which, as centres, it can condense, and notwithstanding, owing to the immense number of solid dust-particles present in the air, condensation takes place upon them, yet they are *not absolutely essential*. It has been shown by Aitken, Helmholtz, and others that, in the absence of dust, cloudy condensation occurs; but the solid nuclei are replaced by other foreign substances. These may be molecules of the vapour of sulphuric acid, or the particles given off by anhydrous sulphuric acid, or even from metal surfaces when heated or electrified."

Terrestrial Magnetism.—According to the Report of the Kew Observatory Committee of the Royal Society for 1898, which has just been published, there were two magnetic storms during the year—namely, on March 14–15, and again on September 9–10. The former was the greatest disturbance registered since August 1894. Both were associated with the auroras that appeared at the same time in the British Isles. The seismograph which has been erected to measure the disturbance along an east to west line, registered the maximum disturbance on June 29, August 31, and November 17. Complaint is made that the electric trams running in the neighbourhood of the observatory impair the efficiency of the magnetographs.

Saturn's Newest Satellite.—The following account of the discovery of a new satellite of Saturn is extracted from the statement made by the discoverer, Professor Pickering of Harvard College Observatory. A careful examination of various photographic plates of Saturn was made by superposing plates taken at different times. A faint object was at last discovered, which appeared in different positions on the two plates, further confirmation of which important fact was obtained by the superposition of other plates. The orbit has been provisionally determined, and it appears to be a very elongated ellipse lying nearly in the plane of the ecliptic. Professor Hale has pointed out that this is to be expected in a body so distant from Saturn. The attraction of Saturn only slightly exceeds that of the sun. As seen from Saturn the new satellite would appear as a star of about the sixth magnitude. Assuming that its reflecting power is the same as that of Titan, it would have a diameter of about 200 miles. It will therefore be noticed that the satellite is probably the faintest body yet discovered in the solar system. It is the largest body discovered since the inner satellites of Uranus in 1851. Professor Bond and his son, of the same observatory, were the fortunate finders of the last-discovered satellite of Saturn in 1848. The satellite Hyperion was seen by the son of Professor Bond on September 16 and 18, but its true character was not recognised until September 19. Professor Pickering suggests that the new body should be named Phœbe, a sister of Saturn, three of the already-named satellites having been christened Tethys, Dione, and Rhea, after other sisters of Saturn—the remaining two, Japetus and Hyperion, being named after brothers of Saturn.

The Evening Examinations.—For the benefit of those students who are to sit at the day examinations in June, a brief word may seasonably be said as to the character of the questions already set for the evening students.

Elementary.—Specific gravity, oxidation of copper, parallelogram of forces, laws of magnetic attraction and repulsion, mercury as a thermometer liquid, moraines, volcanoes, rotation of the earth, the phases of the moon, latitude, and magnetic dip, were the topics touched upon in the questions, which were of the usual piecemeal character.

Advanced.—The paper was a very fair one, the questions being based upon the points given below:—Velocity of sound as compared with that of light in a thunderstorm, clouds as blankets, transverse and longitudinal waves and the velocity of light, isogonic and isoclinic lines, solids in solution in the sea, anticyclones, springs, volcanoes, diagram showing inferior and superior conjunction, apposition, elongation and quadrature, alteration of direction of earth's axis, sun spot, aberration of light.

Honours.—This paper was also a fair one for those who had followed recent work. The questions referred to the determination of an arc of meridian and an arc of parallel, temperature and atmosphere of the sun, chemical elements in the earth's crust and in meteorites, decomposition of felspars, and recent research in either the modification of the properties of bodies by low temperatures or the spectra of the hottest and coolest stars.

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CHEMISTRY NOTES.

BY THOMAS CARTWRIGHT, B.A., B.SC. (LOND.),

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Calcium Phosphide (P_2Ca_3).—This compound has been prepared by M. Henri Moisson by the action of carbon upon $Ca_3(PO_4)_2$. The phosphide is a dark-red crystalline body, whose most curious property is the power it possesses, in common with many other binary compounds of calcium—as, for example, the carbide—of decomposing cold water with great facility, the products of the reaction being calcium hydrate and phosphoretted hydrogen. With the PH_3 may be compared hydrogen, ammonia, and acetylene, which are the products when the hydride, nitride, and carbide respectively act upon cold water.

A New Indicator for Acidimetry and Alkalimetry.—A solution of guaiacal in alkali, mixed with a solution of diazo-paranitraniline, gives a coloured diazo body which is the indicator in question. Two decigrams are dissolved in 100 c.c. of alcohol. With alkalis one or two drops of this solution give a beautiful red coloration, whilst the slightest excess of acid changes it to a greenish yellow. The sensitiveness of the indicator is much greater than that of phenol-phthalein.

Liquid Hydrogen and the Magazines.—At one of his recent Royal Institution lectures, Professor Dewar took occasion to warn the public as to the absurd exaggerations concerning the properties of liquid nitrogen which have obtained currency in the United States, and which are finding their way into English popular magazines. Our readers should be on their guard as to the acceptation of such exaggerations. The most recent discoveries in this connection have been recorded in these columns.

The Allotropes of Phosphorus.—Mr. D. L. Chapman has made the following communications to the Chemical Society:—

1. So-called "metallic" phosphorus is identical with red phosphorus, as is shown by microscopic examination.

2. The vapours of red and of ordinary phosphorus are identical. The vapour density of ordinary phosphorus has been determined at the boiling-points of mercury and of sulphur. It agrees closely with the density calculated on the assumption that the molecule consists of four atoms.

3. Red phosphorus melts, forming ordinary phosphorus, under pressure at the melting-point of potassium iodide. At ordinary temperatures red phosphorus is stable and white phosphorus unstable. Phosphorus therefore appears to possess in a remarkable degree the property of remaining in an unstable condition.

Atomic Weights of Nickel and Cobalt (Ni 58·706, Co 58·995).—Messrs. Richards, Cushman, and Banter have presented papers to the American Academy describing an exhaustive inquiry into the vexed question of the atomic weights of these two transitional elements. Complete analyses of nickelous and cobaltous bromide were undertaken, and the salts were reduced by moist hydrogen, the metals being weighed as such. The weights arrived at as the mean of many concordant experiments were as given at the head of this paragraph. The evidence of all the work is said to strongly support Winkeler's contention that Ni and Co, as we knew of them of old, cannot contain more than an infinitesimal amount of any unknown element. The higher atomic weight accorded to Co conflicts with the inference to be drawn from the position of rhodium and palladium in the periodic classification. The metals prepared as above do not include an appreciable amount of hydrogen, probably on account of the small amount of NaBr present. Both Ni and Co are acted upon by water, giving colloidal solutions of the hydrogen. This, together with the use of glass apparatus, accounts for Krüss's supposed discovery of gnomium. The colloidal solution of cobaltous oxide absorbs oxygen from the air, and deposits cobaltic hydrate; no such action was observed in the case of nickel.

The Sources of the Chief Minerals:—

Coal is supplied mainly by England, but America bids fair to rival the mother country in this respect, as in many others.

Copper.—More than one-half of the total output is to be credited to the U.S.A., the figures for the States being 223 millions of tons. Spain and Portugal rank next as copper-producing countries.

Gold.—South Africa comes first, U.S.A. next, and Australia third, the three countries producing more than a fifth of the world's supply. Russia is a bad fourth.

Iron.—The lead is taken by the U.S.A., Great Britain comes next, and Germany takes third place.

Lead.—Spain first, U.S.A. second, Germany third.

Silver.—U.S.A. first, Mexico second, Australia third.

Tin.—Malay Peninsula first, the rest of the world making but a poor second.

Zinc.—Germany (Upper Silicia) first, being exceptionally rich. The U.S.A. make a bad second.

The Pan-amalgamation of Silver.—In this process it has been assumed that the reduction of the silver sulphide is due to the action of cuprous chloride, but recent researches have greatly weakened this belief. According to Mr. H. F. Collins, a "chloride" ore is readily treated in an iron pan without bluestone or metallic copper, the silver compounds being directly reduced by the iron. In the case of sulphide ores, treatment is facilitated by the addition of copper sulphate (bluestone), which is rapidly reduced to metallic copper by the iron. The copper, whether amalgamated or not, reduces the sulphide to metal, and so renders amalgamation possible. Cuprous chloride never exists in the pan during the reaction, to which fact is attributed the poor results obtained. For more than a hundred years copper-bottomed vessels have been in use in the treatment of sulphide ores, the process being thereby greatly accelerated, since cuprous chloride under such circumstances is largely formed.

Refractory Silver Ores by Lixiviation.—Mr. Breakall dealt with this subject at a recent meeting of the Institution of Mining Engineers, giving testimony in favour of Russell's modification of the hyposulphite process. He described experiments proving that the presence of only 0·2 per cent. of copper increases the volatilisation loss of silver in chloriding roasting. In one case the increase in loss was as high as from 0·5 to 3·6 ounces of silver per ton on the addition of this amount of copper. Metallic silver and silver sulphide are readily dissolved by "hypo" solutions containing copper, though not rapidly acted on in its absence. From this it is plain that the presence of copper should be avoided in the furnace charge, whilst it may be added with advantage during the later stages of the process.

The Evening Examinations.—A few words may advantageously be said concerning the evening examinations in their bearing upon the day examinations that are yet to come.

Theory.—The questions in this part of the work were very fair indeed. Professor Tilden's favourite question—namely, "Describe an experiment that you have performed, or the preparation of a body that you have prepared"—came in both the elementary and the advanced stages, and it will almost surely make its appearance in the day examination. In the advanced stage appeared a request to prove that H_2 represents the constitution of the hydrogen molecule. One very important proof to cite in this connection is that the ratio between the two specific heats is about 1·6, and not less, as would be the case if the gas had atomic molecules.

Advanced Practice.—Here, again, was shown the wisdom of studying the examiners' pet preferences and aversions. Professor Tilden hates the blind worker by the chart. He likes original separations. It has been pointed out in this place that water or a dilute acid will frequently most effectively separate a mixture at the outset. Such a separation is the best possible, and such a separation was asked for in the advanced practical examination, when the bodies given were Cr_2O_3, mixed with (1) $CuCO_3$, (2) $NiCO_3$, (3) $SrCO_3$. By the addition of water the two bodies were completely separated, and the fusion of Cr_2O_3 with KNO_3 made it a matter of only a few minutes to complete the analysis. Such a method, it is certain, the examiners wished to see employed.

The quantitative exercise was easy but irritating. Alloys of copper containing from about 70 to 90 per cent. of copper were to be determined in accordance with the following directions:—

You are supplied with an alloy of copper, in which you are required to determine the proportion of copper.

Proceed as follows:—Weigh carefully 0·5 to 0·7 gram of the metal, dissolve it in the least possible amount of nitric acid mixed with about an equal volume of water. To the solution add ordinary dilute sulphuric acid to make up 25 to 30 c.c. Place in this liquid a small piece of pure zinc, and heat the liquid till it becomes completely decolourised and the copper settles to the bottom. If the blue colour has not disappeared in about a quarter of an hour, add another piece of zinc and a little strong sulphuric acid. When the colour of the liquid has disappeared, and no copper can be detected in a drop poured off and tested separately, pour away the solution, collect the copper in a small porcelain crucible which has been weighed. Wash the metal with water and dry quickly in the steam oven. From the weight of the precipitated copper calculate the percentage of copper in the metal supplied.

You are at liberty to use any other method which you have learned for estimating the copper, but you must in that case write out an account of your process.

N.B.—All the weights necessary for calculating the result must be stated in your answer.

Honours. Part I. Practical. Analyse qualitatively and quantitatively the given alloy (brass in sheet).

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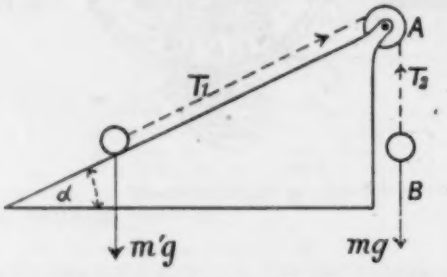
REPLIES TO SCIENCE QUERIES.

Inter. B.Sc. Lond.—The best course for you to pursue will be to perfect yourself thoroughly in your Advanced Science and Art Department work, both theoretical and practical, and to do as many preparations as you can. Newth's *Chemistry*, published by Longmans, will cover most of the ground in the inorganic portion; whilst Perkin and Kipping's *Organic Chemistry*, Part I. (Chambers), will admirably serve as a book of study for the organic portion. A book recently published by Edward Arnold—namely, *Physical Chemistry for Beginners* (Deventer, translated by Lehfeld, etc.)—will supply valuable matter in the domain of physical chemistry, which is becoming more and more important.

Ariadne.—A mass m' is drawn up a smooth plane, inclined at an angle α to the horizon, by a mass m, which is attached to it by a fine string, which latter passes over a heavy rough pulley, of radius r, running in smooth bearings at the top of the plane. The mass of the pulley being M, its radius of gyration k, find



the acceleration of the mass m'. Show if T_1, T_2 are the tensions of the string, the least possible value of the coefficient of friction of the pulley and string, when no slipping takes place, is

$$\frac{\log T_2 - \log T_1}{\frac{\pi}{2} + \alpha}.$$

Assuming no alteration in the length of the string connecting the two masses, then the acceleration of m' is equal to that of m.

Let f = acceleration of m' or m. The component of m' along the plane is $m'g \sin \alpha$.

Hence $m'f = T_1 - m'g \sin \alpha$ . . . . . (1).

The forces acting on the portion AB of the string are T_2, the tension of the string upwards, and mg downwards.

$$\therefore mf = mg - T_2 \quad . \quad . \quad . \quad . \quad . \quad (2).$$

Also, if no slipping occurs, then

$f = r \times$ angular acceleration of pulley $= r\omega$,

but $Mk^2\omega = r(T_2 - T_1)$;

that is, $$\frac{Mk^2}{r^2} f = T_2 - T_1 \quad . \quad . \quad . \quad . \quad . \quad (3).$$

Adding (1) and (2) we obtain

$$(m + m')f = g(m - m' \sin \alpha) - (T_2 - T_1).$$

Also substituting from (3) for $(T_2 - T_1)$ we get

$$(m + m')f = g(m - m' \sin \alpha) - \frac{Mk^2}{r^2} f.$$

Hence $$f\left(m + m' + \frac{Mk^2}{r^2}\right) = g(m - m' \sin \alpha).$$

$$\therefore f = \frac{g(m - m' \sin \alpha)}{m + m' + \frac{Mk^2}{r^2}}.$$

From the diagram it will be seen that the angle subtended at the centre of the pulley by the string is $\left(\frac{\pi}{2} + \alpha\right)$.

Now in any text-book on mechanics it is proved that if a string be passed round a fixed pulley, and a force T_2 act at one end of the string, and a force T_1 at the other, slipping will just take place when $$\frac{T_2}{T_1} = e^{\mu\theta}, \quad . \quad . \quad . \quad . \quad . \quad (4).$$

where μ is the coefficient of friction between the string and the pulley, and θ the angle subtended by the portion of the pulley embraced by the string.

We may write (4) as $\log T_2 - \log T_1 = \mu\theta$.

$$\therefore \mu = \frac{\log T_2 - \log T_1}{\theta} \quad . \quad . \quad . \quad . \quad (5).$$

It will be seen that the given expression is the ordinary result. If μ were less than $\frac{\log T_2 - \log T_1}{\frac{\pi}{2} + \alpha}$, slipping would occur.

Light.—Deduce the formula for a combination of two lenses to be achromatic for excentrical pencils; that is, $a = -\frac{f_1 + f_2}{2}$, where a is the distance between the lenses, and f_1, f_2 are their respective focal lengths.

In Emtage's *Light* it is shown that the magnification produced by a combination of two lenses, of focal lengths f_1 and f_2 respectively, made of the same glass, and placed at a distance, a, apart, is equal to

$$\frac{1}{f_1} + \frac{1}{f_2} + \frac{a}{f_1 f_2}.$$

If R_1 and R_2 are the radii of curvature of the first lens, and if μ is the refractive index, for the middle of the spectrum, of the glass used, then

$$\frac{1}{f_1} = (\mu - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right).$$

The focal length f_{b1} of the same lens, for blue light, is given by

$$\frac{1}{f_{b1}} = (\mu_b - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right),$$

where μ_b is the refractive index of the glass for blue light.

$$\therefore \frac{1}{f_{b1}} = \frac{\mu_b - 1}{\mu - 1}\frac{1}{f_1}.$$

Similarly, if f_{r1} is the focal length of the same lens, and μ_r is the refractive index of the glass, both for red light, we shall have

$$\frac{1}{f_{r1}} = \frac{\mu_r - 1}{\mu - 1}\frac{1}{f_1}.$$

Similarly,

$\frac{1}{f_{b2}} = \frac{\mu_b - 1}{\mu - 1}\frac{1}{f_2}$ for blue light and the second lens;

$\frac{1}{f_{r2}} = \frac{\mu_r - 1}{\mu - 1}\frac{1}{f_2}$ for red light and the second lens.

Now, in order that the combination should be achromatic for excentrical pencils, the magnification must be the same for blue as for red light.

$$\therefore \frac{1}{f_{b1}} + \frac{1}{f_{b2}} + \frac{a}{f_{b1} f_{b2}} = \frac{1}{f_{r1}} + \frac{1}{f_{r2}} + \frac{a}{f_{r1} f_{r2}}.$$

Substituting the values of $\frac{1}{f_{b1}}$, $\frac{1}{f_{b2}}$, etc., which have been found above,

$$\frac{(\mu_b - 1)}{\mu - 1}\left(\frac{1}{f_1} + \frac{1}{f_2}\right) + \left(\frac{\mu_b - 1}{\mu - 1}\right)^2 \frac{a}{f_1 f_2} = \frac{(\mu_r - 1)}{\mu - 1}\left(\frac{1}{f_1} + \frac{1}{f_2}\right) + \left(\frac{\mu_r - 1}{\mu - 1}\right)^2 \frac{a}{f_1 f_2}.$$

Re-arranging, we get

$$\left(\frac{1}{f_1} + \frac{1}{f_2}\right)\frac{(\mu_b - 1) - (\mu_r - 1)}{\mu - 1} + \frac{a}{f_1 f_2}\frac{(\mu_b - 1)^2 - (\mu_r - 1)^2}{(\mu - 1)^2} = 0.$$

But

$$(\mu_b - 1)^2 - (\mu_r - 1)^2 = \{(\mu_b - 1) - (\mu_r - 1)\}\{(\mu_b - 1) + (\mu_r - 1)\};$$

$$\therefore \left(\frac{1}{f_1} + \frac{1}{f_2}\right)\frac{(\mu_b - 1) - (\mu_r - 1)}{\mu - 1} + \frac{a}{f_1 f_2}\frac{\{(\mu_b - 1) - (\mu_r - 1)\}\{(\mu_b - 1) + (\mu_r - 1)\}}{(\mu - 1)^2} = 0.$$

Divide through by $\frac{(\mu_b - 1) - (\mu_r - 1)}{\mu - 1}$. Then

$$\frac{1}{f_1} + \frac{1}{f_2} + \frac{a}{f_1 f_2}\frac{\{(\mu_b - 1) + (\mu_r - 1)\}}{\mu - 1} = 0.$$

Now, since μ = refractive index of the glass *for the middle of the spectrum*, we may, to a first approximation, take

$$\mu = \frac{\mu_b + \mu_r}{2}.$$

$$\therefore (\mu_b - 1) + (\mu_r - 1) = \mu_b + \mu_r - 2 = 2(\mu - 1).$$

Substituting this value, we get

$$\frac{1}{f_1} + \frac{1}{f_2} + \frac{a}{f_1 f_2}\frac{2(\mu - 1)}{\mu - 1} = 0.$$

$$\therefore \frac{1}{f_1} + \frac{1}{f_2} + \frac{2a}{f_1 f_2} = 0.$$

$$\therefore a = -\left(\frac{f_1 + f_2}{2}\right).$$

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OUR COMPETITION PAGE

OUR FRENCH AND GERMAN PRIZE COMPETITION.

Prize Editor—W. T. THOMPSON, B.A. (LOND.), *French and German Honours.*

RULES.

1. All translations should be posted not later than June 8, and addressed:—*Prize Editor*, Office of THE PRACTICAL TEACHER, 33 Paternoster Row, London, E.C.
2. Competitors should cut out and send the Coupon which appears on the Back Wrapper page of the current number.
3. Competitors should adopt a pseudonym, and send name and address written on a separate piece of paper.
4. No competitor may take the prize offered more than once in three months.

FRENCH COMPETITION.

A Prize of One Guinea will be given for the best translation into English of the following extract:—

Un soir, devant Perpignan, il se passa une chose inaccoutumée. Il était dix heures, et tout dormait, lorsque tout à coup les trompettes des mousquetaires, des chevau-légers et des gens d'armes sonnèrent, presque en même temps, le *boute-selle* et *à cheval*. Tous les factionnaires crièrent aux armes et l'on vit les sergents de bataille, portant des flambeaux, aller de tente en tente, une longue pique à la main, pour réveiller les soldats, les ranger en ligne et les compter. De longs pelotons marchaient dans un sombre silence, circulaient dans les rues du camp et venaient prendre leur place de bataille; on entendait le choc des bottes pesantes et le bruit du trot des escadrons, annonçant que la cavalerie faisait les mêmes dispositions. Après une demi-heure de mouvement, les bruits cessèrent, les flambeaux s'éteignirent, et tout rentra dans le calme; seulement l'armée était debout. Des flambeaux intérieurs faisaient briller comme une étoile l'une des dernières tentes du camp; on distinguait en approchant cette petite pyramide blanche et transparente; sur sa toile se dessinaient deux ombres qui allaient et venaient. Dehors, plusieurs hommes à cheval attendaient: dedans étaient de Thou et Cinq-Mars.

ALFRED DE VIGNY.

RESULT OF THE MAY COMPETITION.

THE prize is awarded to "Taugenichts," the pseudonym of Robert Clark, F.E.I.S., National School, Seaham Harbour.

First Class.—Chemineau, Polly, Mab (Bangor), Kernéwote, Hudeshope, Kingston, Cestrian, Nellie, Agaznog, Mary Josephine, Mariquita, Dr. Dee, Lucille, Cymru, Celt, Bossuet, Tête-à-tête, Ne m'oubliez pas, Tibbie, Ashdown, Braxet, L.F.C., Jerome, Immacolata, Festiniog, Notelgnoc, Iolo Morganwg, Cranford, M.F.C., Nancy, Zaïre, Ivy leaf, Rekrap, S.E.L.A., Carpe diem, Forward, Vic, Nan (Oxford), Smoke, Annette, Allez, Crockitwuds, Duns Scotus, Tree-pot, Bangalore, Jeanie Deans, Des Roches, F.H.C., Fanny Sands, Orphir, Louisiana, Primevère, Primrose (Driffield), Saxifrage, Grateful, Carvajan, Keep at it, Rhynie.

Second Class.—Cherry Blossom, Mab (Liverpool), Fidus Achates, Bruyère, Kythé, Eicarg Retsam, Imogen, Iceberg, X.Y.Z., Kathleen, La Clyde, Gleaner, Skoola, Marguerite, Cymbeline, Gawik, Endeavour, Iron, Primrose (Fife), Iris, A.M.B., Daphne, Tris, Spring, Peggy Primrose, Marchesini.

Third Class.—St. Swithin, Rosiné, Expectant, Nan (Mossley).

The most noticeable feature in the competition under review was the number of really excellent translations sent in. It sometimes happens that a particular translation is unmistakably the best of those received, but this month it has been a matter of great difficulty to make the prize award. The syntax of the passage, *la prétention.....de rendre par surcroît un service social*, proved a difficulty to very many. Only a few failed entirely to grasp the main idea of the extract. Two competitors, evidently looking upon the passage as a piece of irony, translated *bretonne* as "Briton," and three, misled by the double meaning of *exploit*, made the author assert that wealth is only acquired by serving writs (!) on others.

Prize Translation.

The characteristic feature of the Breton race in every rank is its idealism, its endeavour after a moral or intellectual end which is often a mistaken one and always an unselfish. Never was a race less fitted for trade or commerce. Appeal to its honour, and nothing is refused you; but money-making it thinks unworthy of a true gentleman. The vocation for a gentleman, in a Breton's eyes, is one that brings no gain—as that of the soldier, the sailor, the priest, the magistrate, the laborious and devoted thinker, the real nobleman who draws from his lands nothing more than the income sanctioned by custom, and seeks not to increase it. Most of these reasonings are based on the notion—doubtless an erroneous one—that the only way to get wealth is to take advantage of others and grind the faces of the poor. It results from such a way of looking at things that a rich man is not greatly respected. Much more so is he who devotes himself to the public welfare, or represents the raciness of the soil. These honest folk have no patience with the claim advanced by men who are accumulating wealth that, by increasing their riches, they are conferring a benefit on the community. When they were told formerly, "The king values his Bretons highly," they were satisfied. The king's pleasure was their joy; his abundance, their wealth. Convinced that the gain of one is the loss of another, they deemed the greed for gold debasing. Such ideas of political economy have grown old fashioned. Nevertheless the whirligig of time may some day bring men's opinions round to the same point again, and, at least, let us view with indulgence the little band of survivors of another world wherein this harmless delusion kept alive the tradition of self-sacrifice.—*Taugenichts.*

GERMAN COMPETITION.

A Prize of Half a Guinea will be given for the best translation into English of the following extract:—

Die Form der römischen Hegemonie über Latium war im Ganzen die eines gleichen Bündnisses zwischen der römischen Gemeinde einerseits und der lateinischen Eidgenossenschaft andererseits, wodurch ein ewiger Landfriede in der ganzen Mark und ein ewiges Bündniss für den Angriff wie für die Vertheidigung festgestellt ward. "Friede soll sein zwischen den Römern und allen Gemeinden der Latiner, so lange Himmel und Erde bestehen; sie sollen nicht Krieg führen unter einander noch Feinde ins Land rufen noch Feinden den Durchzug gestatten; dem Angegriffenen soll Hülfe geleistet werden mit gesammter Hand und gleichmässig vertheilt werden was gewonnen ist im gemeinschaftlichen Krieg." Die verbriefte Rechtsgleichheit im Handel und Wandel, im Creditverkehr wie im Erbrecht, verflocht die Interessenen der schon durch die gleiche Sprache und Sitte verbundenen Gemeinden noch durch die tausendfachen Beziehungen des Geschäftsverkehrs, und es ward damit etwas Aehnliches erreicht wie in unserer Zeit durch die Beseitigung der Zollschranken.

MOMMSEN.

TO TEACHERS INTERESTED IN PRACTICAL BOTANY.

WILLIAM HOOD, of the Practical Teacher Central Classes, Sunderland, would be pleased to correspond with botanists in any part of the British Isles with a view to the exchanging of specimens, etc., and, if possible, to the forming of a "Botanical Correspondence Club."

(Several Competitors were disqualified under Rule 2 this month.)

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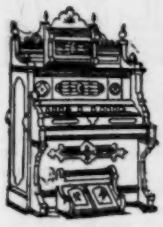

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THE EDITOR'S TABLE

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A Manual of Psychology. Vol. I. By G. F. Stout, M.A., London. Though not written expressly for teachers, this little work cannot fail to be of the utmost service to any intelligent teacher into whose hands it may fall. The applications to education are not made, but all the materials necessary as a foundation of a genuine educational psychology are here presented in an admirably well-arranged way. One feature of the book is the eminently intelligible form in which the author presents the metaphysical basis of his subject. Another is the lack of a resounding nomenclature. So far from seeking to arouse wonder and admiration by the formidable nature of his vocabulary, Mr. Stout goes far towards reducing psychological terms to their lowest common denominator. The "faculties" cast off the verbal dead-weights under which they have so long laboured, and become in these pages "ultimate modes of being conscious." To those accustomed to read books of this class, it is clear that there is more than mere style at the bottom of this distinction between special and general names; and those who are familiar with Mr. Stout's other works will have no difficulty in recognising our author's vigorous fight against the all but universal tendency to reduce psychology to mythology by endowing mere abstractions with a positive concrete existence. The author's method lends itself specially to the teacher's needs, as it follows the natural order of development of the "modes of being conscious." This genetic method is the only one valuable for teachers, and no teacher will ever regret spending a good deal of time in mastering this method as set forth in the pages of Mr. Stout.

Latin for Matriculation. As many of our readers will be doubtless planning their studies for the London Matriculation Examination of June 1900, the month is opportune for calling attention to the University Correspondence College series of excellent text-books. Edited by expert tutors in connection with the College, these thoroughly-practical, clearly-printed, and well-bound volumes will be found invaluable to all students of Latin, and especially to intending matriculants, for whom they have been specially prepared.

The Tutorial Latin Grammar (B. J. Hayes, M.A., W. F. Mason, M.A.) contains the rudiments of accidence and syntax, clearly arranged, and set in good bold type. The object kept in view throughout in preparing this book was to produce a grammar which should impart a sound knowledge of the language of the classical period without encumbering the reader with a number of rare forms and usages; and the examples in the syntax have been drawn to a great extent from the classics most usually read. *Exercises and Test Questions* (F. L. D. Richardson, B.A., A. E. W. Hazell, LL.D.) on this Grammar are issued in separate form, with a most serviceable and complete vocabulary.

The Latin Composition and Syntax (A. H. Allcroft, M.A., J. H. Hayden) is another carefully-prepared volume, and is intended to serve as a guide to the writing of Latin up to the point at which the student enters upon the composition of continuous prose.

The Tutorial Latin Reader consists of a graduated series of extracts for practice in translation at sight, with an appendix of unseen passages set at the London University Matriculation and Intermediate Arts Examinations from 1875 to 1896.

Keys to the whole of the books are issued for the use of teachers and private students.

In addition to the foregoing, a fully-annotated edition of the Latin book prescribed for June 1900 (*Cæsar: The Invasion of Great Britain*) has just been issued. The names of the editors —Messrs. A. H. Allcroft, M.A., and T. R. Mills, M.A.—are a sufficient guarantee that the work of annotation has been done carefully, and in such a way as to give the greatest possible aid to the private student. A good historical introduction with maps appears in the book. Another indispensable aid to the student is the *Tutorial Latin Dictionary*, by F. G. Plaistowe, M.A. A special feature of this Dictionary is that it contains all the words found in the Latin authors which are ordinarily read in schools and by candidates for pass examinations at the universities.

THE CLARENDON PRESS.

The Educational Systems of Great Britain and Ireland. By Graham Balfour, M.A. The scope of this book is apt to be mistaken by a mere glance at the title. It is not a book on pedagogy at all, but an invaluable compendium of the facts regarding British education during the nineteenth century. The author tells us that the book was suggested by Mr. M. E. Sadler, whose reports have already done so much in arousing interest in education, and directing that interest into proper and profitable channels. This volume cannot fail to prove of the utmost value to all who seek to form clear ideas of how we stand in order to determine how we ought to stand in the matter of education. The reader must, however, do his own thinking. The author merely puts the reader in possession of all the relevant facts, and leaves him to come to his own conclusion. So anxious, indeed, has Mr. Balfour been to avoid preconceived opinions that he did not write his introduction—in which he gathers up his facts and draws some general conclusions—till he had finished the book. According to the author, an "impartial and even tedious catalogue of existing agencies seemed likely to be more effectual in indicating the present deficiencies and requirements of these islands than any more impassioned advocacy of my own or anybody else's views." The book is certainly impartial; it can prove tedious only to those who have little interest in education.

If all our members of Parliament were compelled to read this book, it would lead to a very different kind of talk on educational questions. The book is indeed a sort of *Thesaurus* of arguments from which materials may be drawn to support any educational policy by those who are special pleaders; but any fair-minded reader cannot rise from this book and talk the nonsense that we sometimes hear on this subject. Every teacher should read the volume. Never before, so far as we can learn, has such a comprehensive view of all grades of education been attempted. No doubt the author might have gone further back; but the wisdom of a longer history is very doubtful. A hundred years seems quite a satisfactory run to get up momentum for the leap into futurity. As to the ground covered during this century, we venture to say that no book before ever approached the attainment of Mr. Balfour. No teacher, however well read and however deeply interested in his profession, can read this book without learning much. We all know one branch of the development of our profession. Few among us have either the desire or the opportunity of knowing the state of our profession as a whole. The desire may still be lacking; we can no longer plead the lack of opportunity. Nothing can aid so much in promoting the solidarity of the teaching profession as the mastery of the comprehensive treatise now before us. Mr. Balfour is to be congratulated on his book, and teachers and legislators are to be congratulated on its very opportune publication.

WILLIAM BLACKWOOD AND SONS.

Natural History (Vertebrates) of the British Isles. Aflalo. The literature dealing with British natural history can scarcely be regarded as satisfactory, consisting, as it does, very largely of scattered papers and works dealing with only sections of the subject. There are many small books which treat more or less comprehensively of the animals of particular districts, the boundaries of which are the somewhat artificial delimitations of our English counties. In the present work Mr. Aflalo has endeavoured to take a more general survey of the whole field, and to supply a kind of introduction to such treatises. He has, hence, dealt only in a very general way with the physical peculiarities of the various zoological divisions of the country, and has put altogether on one side such subordinate matters as the county boundaries, except where these really conform to natural or physical lines of demarcation.

The fauna of Great Britain and Ireland is a very small one, only including some 700 vertebrate forms. Mr. Aflalo has dealt with it altogether from the point of view of natural history, and has refrained from discussing questions of anatomy or of general distribution. The work is necessarily largely a compilation, but by no means entirely so, as the author has included in it original observations and certain speculations of considerable interest.

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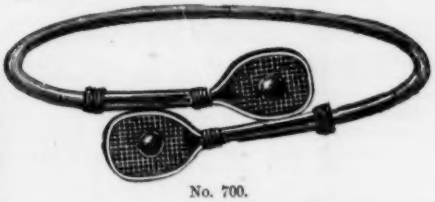

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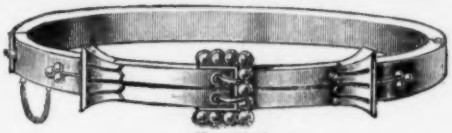

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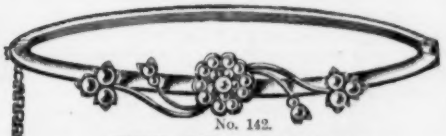

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The book will appeal more largely to the general reader than to the severely-scientific student. The nomenclature adopted is popular, the common local names being almost invariably used, though their scientific equivalents are mentioned.

Mr. Aflalo incidentally calls attention to what many regard as one of the most interesting features of the study of existing and extinct forms, pointing out that important deductions may be made therefrom—as, the distribution of land and sea in the remote past. Here he follows the line of other writers on the same subject, especially Mr. Wallace, who has done so much to elucidate such problems. Mr. Aflalo emphasises the contrast between the faunas of Great Britain and of Ireland, as giving evidence of the earlier isolation of the latter island from continental Europe.

A section which will be read with much interest deals with the comparison of the fauna of to-day with that of five hundred years ago. This study becomes more fascinating when we remember the almost total impossibility of the reappearance of any species which has once become extinct—an impossibility which is the almost necessary consequence of the isolated position of the area under discussion. The author seeks to trace the causes leading to the comparatively slow process of extinction of species which is even now going on—a process which, however, is infinitely more gradual than that which obtained in the distant past, and which can be seen in the larger areas of America and Africa to-day. He is especially severe upon the "museum man" or collector, whose depredations, alas, are not confined to the fauna, but are responsible for serious gaps in the flora also.

Another very valuable feature of the volume is the admirable bibliography with which it concludes. It is, in many respects, a thankless task to ransack libraries and magazines for almost forgotten works in local natural history. To many readers, however, including the keener scientific students, such collections are of the greatest value, and such readers owe a debt of gratitude to Mr. Aflalo for the care he has taken in the preparation of this list of publications.

G. BELL AND SONS.

Elementary Botany. Groom. In writing a text-book of elementary botany, an author generally finds himself subject to continual temptation to interpret the word *elementary* in a somewhat wide sense, and consequently to introduce matter which is above the heads of readers who are endeavouring to make acquaintance with the subject without the assistance of a teacher. The great importance which is nowadays attached to what is called the biological side of botany has effected a great change in the kind of text-book which is put into the hands of the beginner, and by no means always to his advantage. He is too frequently encouraged to rush at once into the details of anatomy, which demand the application of the microscope, to the very great risk of his ignoring the general naked-eye characters which plants present. The result is far from encouraging: the study of the natural history of plants, which should be the most fascinating for, at any rate, such students as live in the country, receives but little attention, and the text-book supersedes nature in the learner's estimation.

The present volume is a protest against this mode of study. Mr. Groom has carefully put the naked-eye appearances of plants in the first place, and has written an admirable introduction to their practical examination. He has treated primarily of the morphology of plants, using the expression in the narrower sense, which excludes minute anatomy; at the same time he has added a section upon physiology, in which he points out generally the functions which the different organs discharge.

The book contains also a section which may serve as an introduction to a closer acquaintance with the plants of the British flora. Mr. Groom has selected several of the commoner natural orders, and has discussed their structure in the light of their general relationships. The descriptions are well illustrated, so that, with no further assistance, a beginner may well make himself very fairly acquainted with them.

It is rather a pity that in his preface Mr. Groom should have somewhat departed from his leading idea of encouraging the study of natural history for its own sake, by introducing the question of examinations. He says that the book is not a "cram-book" for any of these, but proceeds to qualify this statement by the assurance that a thorough knowledge of its contents "will enable a candidate to pass with distinction."

A. AND C. BLACK.

Introduction to Algebra, for the Use of Secondary Schools and Technical Colleges. By G. Chrystal, M.A., LL.D. "The English text-books of algebra," if we may quote from Professor Chrystal's humorous *Apologia pro Vita Sua*, "in vogue during the latter part of this century have tended to degenerate into a mere farrago of rules and artifices, directed to the solution of examination puzzles of a somewhat stereotyped character, having little visible relation to one another, and still less bearing on practice. If general principles appeared at all, they were usually huddled apologetically into a chapter of 'Miscellaneous Theorems'—an arrangement which we might parallel by building a man of muscle and tendons, etc., and putting all his bones into his coat-tail pocket. It has been often and loudly complained that algebra thus taught will not bear the superstructure of a university course.....The present attempt to remedy these evils is a compromise....."

Let us heartily admit that whatever Professor Chrystal writes is bound to be worth reading, and that this is a book which every teacher who does not possess, and is not saturated with the spirit of, the professor's larger work on the same subject (in two portly volumes), ought at once to acquire and to master. There is not a page, hardly a line, from which a teacher will not gather inspiration. Yet when all this is said and reiterated, a reviewer must pause before he can recommend the work as a school text-book. We are not prepared to admit that English text-books are in quite such a hopeless case as the professor assumes. The professor's assumption that, properly taught, every algebraical student should have knowledge capable of bearing "the superstructure of a university course" is a pathetic fallacy. His experience has, admittedly, lain almost wholly among young men, while the *genus puer* is known to him only in his hours of torture in the examination room. If he finds an examinee (may we be forgiven the use of the word!) who confuses hopelessly 2^3 and 2×3, or even 23, who insists that $(a^m)^n = a^{m+n}$, the professor is apt to assume that he has been badly taught, and that the blame is the schoolmaster's, and the schoolmaster must bear it meekly and uncomplainingly—

"For sufferance is the badge of all our tribe."

The professor would remedy matters with general principles. His work bristles with laws and technicalities. An "Index of Technical Words and Phrases" is mercifully provided, and about 300 such are duly catalogued. There can be no doubt about the logical precision of it; but surely the professor forgets occasionally that in teaching it is often essential to teach a partial truth (which is sometimes a partial falsehood) as an introduction to a larger truth. There are minds large enough to contain the whole truth—that is, "bear the superstructure of a university course;" there are others in which the whole truth produces chaos, and the superstructure crashes down, *and* ruins the foundations.

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Or this mountainous phrase (from p. 8),—

"Any concatenation of operands and operating symbols which has an intelligible meaning according to the fundamental definition or interpretation of these operands and operating symbols we call a function of the operands in question."

We had marked down a dozen other passages for comment, but our space is gone. We can only reiterate that this book is a most admirable one for teachers, but that for pupils—the private pupil particularly—it is, in our opinion, impossible. The elementary algebra, on scientific lines acceptable to the professor, has still to be written. Professor Chrystal's Introduction needs a Commentary!

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Key to Algebraical Factors. By Dorabji H. Vachha. This is a book printed—and badly printed—in India. There is scarcely a page which has been properly justified, scarcely a title which does not wave wildly up and down.

Apart from this it is good, and, so far as we have observed, accurate; yet we do not think that Professor Chrystal would treat it kindly. It is an excerpt, a special treatise on a limited portion of the subject, which, by virtue of its isolation, gains a fictitious importance. It may be safely commended as an additional help to any who have found factorisation insufficiently treated in their Algebras, or to teachers who want a wider selection of examples.

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